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H. Ian Macdonald, Deputy Minister



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The Ontario Economy

The Input-Output Structure of The Niagara Region

S. M. Batrik, *Economist*

Department of Treasury and Economics

Selected Economic Indicators

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Hon. W. Darcy McKeough
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H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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About the Review

The January/February edition of the *Ontario Economic Review* presents an article on the recently completed input-output table for the Niagara Region of the Province of Ontario. The table portrays the regional economic structure in terms of interindustry flows of goods and services and their interrelation with the final demand sector. The study also examines the extent to which this regional model can improve our analytical capability for economic forecasting and identifying key productive sectors at the regional level.

The first part of this article outlines the conceptual framework of the Niagara input-output model and provides a concise exposition of the underlying methodology. In the second part, an attempt was made to apply the regional input-output model to estimate the regional income multipliers for different sectors and their effects in terms of income generation. The three basic tables — the transactions flow table, the direct requirements table and the total requirements table — are examined and presented in tabular form in the Appendix. The final section provides a summary of the statistical data sources and estimating procedures used in the construction of the model.

This article was prepared by Mr. S. M. Batrik of the Economic Analysis Branch of the Economic and Statistical Services Division.

The Ontario and Canada economic review of 1971 and forecast for 1972 was prepared by the Economic Planning Branch, Policy Planning Division, Department of Treasury and Economics.

Indicator Charts, Pages 40-42

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of overall economy. The charts on pages 40-42 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

CANADA — 1971 IN PERSPECTIVE

In Canada, the focus of economic policy in 1971 shifted towards the creation of additional jobs. Evidence of this was seen in the expansionary June 18 federal budget which intended to stimulate the economy by removing the personal and corporate 3 per cent surtax, lowering other taxes to pensioners and removing, through the introduction of the tax reform bill, some of the uncertainties that had plagued the business community since the release of the White Paper on Tax Reform in the fall of 1969. With a relatively high growth in GNP in the first two quarters, resulting from a strong recovery in consumer spending, rising exports, and a buoyant construction sector, a mood of cautious optimism permeated the economy at mid-year.

This optimism was short-lived, as on August 15, President Nixon unveiled a set of economic measures designed to restore the sagging U.S. economy to its potential. The Nixon package immediately re-introduced a climate of uncertainty and pessimism throughout the economy. The uncertainty was reinforced by concerted efforts by Congress to bring about speedy passage of the Domestic International Sales Corporation (DISC) plan and the Job Development Tax Credit (JDTC) plan, both of which would have had serious effects on the Canadian economy in the long run. In addition, discretionary powers granted President Nixon to impose further import curbs and to levy a special 7 per cent excise tax on Canadian-made cars further aggravated an unhealthy situation.

The federal government, realizing that additional firm action was necessary to keep the economy from losing its momentum, introduced further expansionary measures on October 14. Besides increasing government spending through extensive winter works programs, personal tax rates were cut 3 per cent to bolster consumer spending and corporation taxes were lowered by 7 per cent to provide corporations with an opportunity to expand their operations and create much needed jobs.

The programs aimed at expanding the economy were only partially successful. It is true that growth of GNP reached 9.1 per cent and exports, despite Mr. Nixon's measures, rose in the last half of the year while consumer spending was very buoyant in 1971. Against this background of growth, however, unemployment continued to climb and rose to the highest levels in over ten years, with

the result that an average 6.4 per cent of Canada's labour force was out of work in 1971. While some of this increase could be attributed to an extraordinarily rapid growth in the labour force and some paring of personnel by many employers, the federal government's measures were not immediately adequate to meet the employment demands of the country. It was also disappointing that manufacturing operations, which have a high labour content, remained very sluggish throughout the year, while other sectors, not so labour-intensive, surged ahead.

Business confidence received a welcome stimulus on December 18, 1971 when the U.S. removed the 10 per cent surcharge and the Group of Ten countries agreed on a general international currency realignment. It was also agreed that Canada would continue negotiations with the U.S. on trade matters that have been of concern to the U.S., such as the Auto Pact, Canadian purchases under defense purchase agreements and the smallness of the duty-free allowance received by Canadian tourists returning from the U.S.

In general, 1972 began with renewed optimism and economic vigour.

CANADA — OUTLOOK IN 1972

The recovery of the Canadian economy, well underway in 1971, will continue throughout

1972, as total real output of all goods and services is expected to increase by 6.3 per cent. This is more than one per cent above the average compound growth rate over the period 1965-70.

The momentum of consumer spending should continue through 1972, since disposable incomes will be increased by the 3 per cent tax reduction which took effect on January 1, 1972 and by higher unemployment insurance benefits and increased family allowances and increased employment. In total, a 9.5 per cent increase in consumer spending on goods and services is expected for 1972.

Capital expenditures by business and governments will probably not increase as much as in 1971. A slowdown in the rate of growth in the residential construction sector, which enjoyed a record year in 1971, will be the main factor in the decline from 10.6 per cent growth in 1971 to 7.8 per cent in 1972. With the anticipated rapid growth of the U.S. economy, the removal of the surcharge and the upward valuation of European currencies, exports should increase by about 9.0 per cent in 1972 compared to 6.5 per cent in 1971. On the other hand, sizable increases in disposable income of Canadians will make foreign goods more attractive, so imports are expected to rise 12.0 per cent this year.

A summary of the forecast for Canada on a National Accounts basis is given below.

Gross National Product — Canada (\$ millions)

	1970	1971	1972	1971/70	1972/71
		Est.	Forecast	Per Cent	Change
Personal expenditure on consumer goods and services	48,995	53,356	58,425	8.9	9.5
Government current expenditure on goods and services	15,802	17,888	20,320	13.2	13.6
Gross fixed capital formation	17,961	19,865	21,405	10.6	7.8
Value of physical change in inventories	122	100	800	—	—
Exports of goods and services	20,969	22,332	24,341	6.5	9.0
Imports of goods and services	19,833	21,915	24,545	10.5	12.0
Gross National Expenditure at Market Prices	84,468	92,126	101,246	9.1	9.9
Implicit Price Index (1961 = 100)	133.6	137.7	142.4	3.1	3.4
Gross National Expenditure at Constant 1961 Dollars	63,210	66,903	71,100	5.8	6.3

Source: Statistics Canada, National Income and Expenditure Accounts, Third Quarter 1971.
Estimates and Forecast by Economic Planning Branch, Department of Treasury and Economics.

THE ONTARIO ECONOMY IN 1972

The Ontario economy has recovered substantially from a low point in late 1970. The provincial government led the way by introducing, in the spring budget of 1971, a 5 per cent tax credit on machinery and equipment, and subsequently matched the federal government tax cuts of October 14 by cutting Ontario's share of the personal income tax by 3 per cent. In addition, it stimulated the economy through large outlays on public housing and supplemented the federal winter works program by one of its own.

During 1971, Ontario's labour force grew at an unusually rapid rate and as a result, while employment increased by approximately 83,000 or 2.8 per cent from 1970, the unemployment rate remained at an unacceptable 5.2 per cent. It is expected that unemployment will improve steadily in 1972 and will reach 5.0 per cent for the year as a whole.

It is anticipated that the U.S. economy will recover strongly after a sluggish performance in 1971. This resurgence of activity in the U.S. will have a strong stimulating effect on the Ontario economy through increased exports.

While it is highly probable that retail sales in Ontario as in the rest of Canada will be buoyant, indications are that total investment in Ontario will be below the national average. This will result from a slowdown in residential construction, and from the regional policies of the federal government designed to stimulate investment more in other parts of Canada.

In total, growth of gross provincial product will be 9.9 per cent in 1972 compared to 9.0

per cent in 1971. After discounting price increases of 3.4 per cent, real growth will be 6.3 per cent compared to 5.7 per cent in 1971.

While it is expected that overall growth of the Ontario economy will be similar to that of Canada as a whole, differences between various sectors will occur. For example, while it is anticipated that increases in manufacturing and exports will be greater in Ontario than in Canada, increases in government spending and investment will be lower in Ontario. The net effect of these differences will be similar overall growth patterns in Ontario and Canada.

Consumer Demand

Despite a relatively slow start at the beginning of 1971, expenditures by consumers on goods and services contributed strongly to the economic growth of the province. Buoyed by a remarkable surge at year's end, retail sales in Ontario in 1971 were approximately 9 per cent above levels attained in 1970.

Statistics for the first nine months of 1971 show the largest increases were recorded by automobile dealers, women's clothing stores, furniture dealers, and department stores, while food, grocery and drug stores registered only nominal gains.

Automobile sales were up mainly because of a backlog of demand from late 1970 and an anticipation of price increases in the later part of the year.

Sales of women's clothing which increased by 12.6 per cent were primarily due to stabilizing of women's fashions.

Furniture, T.V., radio and appliance stores, spurred on by a record number of

housing completions, also saw very brisk activity as their sales in the first nine months of 1971 increased 9.1 per cent over the same period in 1970.

On the other hand, food stores, under the influence of prolonged price wars had increases in sales of only 0.5 per cent.

In comparison with 1970, when total retail sales grew only enough to cover price increases, 1971 was an excellent year for retailers; after price increases are discounted, total volume of retail sales increased by about 5.8 per cent and it is expected that retail spending in 1972 will increase by a further 8.5 to 9 per cent. Consumers will be encouraged by higher disposable incomes due to the removal of the 3 per cent surtax and the further 3 per cent tax cut announced in the October 14 mini-budget, increased transfer payments from higher unemployment insurance benefits and family allowances, and many escalation clauses in existing labour contracts as well as increasing employment. A further expansion in consumer credit, which seems most likely in 1972, will also help bolster retail sales.

Department stores benefiting from substantial additions to the number of outlets in Ontario should do moderately better than many other sections of the retail trade.

In 1972 automobile sales will not increase as rapidly as in 1971 when sales were boosted artificially by the strike in late 1970.

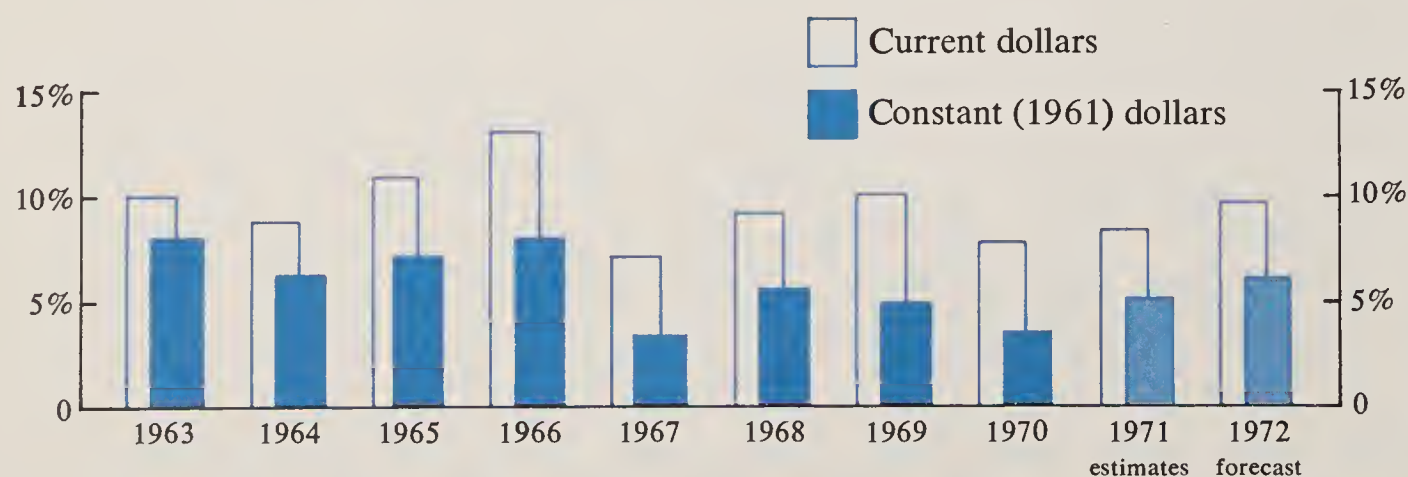
Consumer spending on services, which increased by over 10 per cent, was largely due to a sizable increase in tourist expenditure abroad. Notable gains also occurred in spending on restaurant meals, on motels and hotels, and on legal and financial services. It is expected that increases in spending in the services sector will continue at this rate in 1972.

Private and Public Investment

Estimates made on the basis of surveys conducted by the federal Department of Industry, Trade and Commerce in mid-1971 indicated that capital spending in the province would amount to \$7.5 billion, an increase of 8.9 per cent over the previous year. Firm figures on levels of capital expenditure for the year are not yet available, but it is unlikely that this level was realized. In the past, there has been a clearly discernible relation between plans and expenditures; when the pace of business activity has accelerated, expenditures have in most instances exceeded the amount planned, while the reverse

Ontario's Gross Provincial Product

Per cent change from previous year



HA 747 0656 1972 VOL. 10 NO. 1

been true during times of slowdown and uncertain economic conditions. On the basis of this evidence, it is likely that capital outlays slowed during the last quarter of 1971 and therefore it is expected that outlays in 1971 increased by 7.0 per cent, not the 8.9 per cent that had been previously forecast.

While total investment in the province did not come up to expectations, activity in the residential housing sector exceeded earlier predictions, with the result that housing expenditures contributed more to growth than any other sector. This was largely due to easing of interest rates, greater availability of funds, and to the shortfall of new housing units in 1970.

N.H.A. mortgage rates have been declining steadily since April 1970 from a historic high of 10.25 per cent to an average of 8.75 per cent by the end of 1971. It is likely that these rates will stabilize at present levels or ease slightly in 1972.

Although final year-end data are not yet available, it appears that around 90,000 units were started in Ontario in 1971. In contrast to the immediately preceding years, when there was a sharp trend towards construction of multiple-unit dwellings, 1971 saw a reversal of this pattern and a concentration on single family dwellings. This was especially true in large urban centres such as Toronto, where the number of single-family dwellings started increased by 107 per cent while apartment unit starts rose only one per cent.

Construction initiated by the Ontario Housing Corporation also increased considerably in 1971. Preliminary totals indicate the province has kept pace with the increases in private industry, as 11,000 units¹ were started by OHC.

Ontario has steadily increased its involvement in the housing field since the formation

of OHC in 1964. In 1965, the first full year during which OHC was in operation, public housing starts made up only 1.8 per cent of the total; by 1971, this total had increased to 12 per cent. It is anticipated that with increasing urbanization and accompanying rises in the price of land, public housing needs will continue to increase in the future, and consequently more of the province's resources will have to be allocated to this sector.

A brisk year in residential housing construction is expected again for 1972, but the increases of over 20 per cent experienced in 1971 will not be repeated. Nevertheless, given the current economic situation, efforts will be made by all levels of government to keep housing construction at present levels, so it is expected that 85,000 - 90,000 units will again be started this year. While the total number of starts will probably decrease slightly, investment in the residential sector will rise by around 8.5 per cent.

Some adverse effects on investment in Ontario resulting from the recently passed DISC plan may be noticed by late 1972. The DISC plan permits formation of companies called Domestic International Sales Corporations (DISC) which will be allowed to defer tax on 50 per cent of income as long as profits from the DISC are re-invested in the U.S. Since Ontario has a large proportion of Canada's manufacturing facilities, many of which are subsidiaries of U.S. parent corporations, the DISC plan could lead to substantial decreases in capital spending by U.S.-owned corporations located in Ontario.

With added incentives by U.S. firms to expand operations at home and a general cautious attitude by many Canadian businessmen, it is expected that total non-residential construction will only be 5.8 per cent greater

in 1972 and outlays on machinery and equipment will increase by 6.1 per cent.

On the basis of forecasts of residential construction, machinery and equipment, and non-residential construction, the overall gain in private and public investment is expected to be 6.5 per cent this year over 1971.

Labour Market Conditions in 1971

In 1971 the overall labour market conditions were the worst since 1961. Unemployment, which climbed to over two hundred thousand last winter, remained at unusually high levels throughout the summer. The federal government policies to stimulate the economy (as originally contained in the June 18 budget) were not strong enough to provide the necessary take-off, and further measures had to be brought forth in the October 14 mini-budget, particularly in view of the U.S. initiatives of August 15. On average, Ontario had about 134,000 unemployed between January and December 1970, but in 1971 the number of unemployed increased to 170,000 during the corresponding period. The number of unemployed in the province from January to December 1971 reached an average of 5.2 per cent of the labour force.

One of the important characteristics of the labour market in the last two years has been the increasing gap between the rate of growth of the labour force and the increase in the number of new jobs in the economy. The labour force increased by 3.8 per cent in 1971 and 3.3 per cent in 1970. Employment, on the other hand, increased by only 2.8 and 2.0 per cent in the comparable periods.

Experience indicates that the goods-producing sectors react more strongly to an economic downturn than do the service industries. When output is curtailed sharply, many heads of families find themselves without a job. Accordingly their wives may seek employment in the more stable service sector, with the hope for better job opportunities than their unemployed husbands.

Another phenomenon of the 1971 labour market was the increased interest of young people in obtaining employment. This may, to some extent, reflect the growing disapproval of the present-day educational system by young people who would rather find a job than continue their education, and the fact that an education does not guarantee a job of their choice on graduation. It is also a reflection of the age distribution of the population, as the number of young people of

Investment — Ontario (\$ billion)

	1971	1972	Per Cent Change	
	Estimate	Forecast	1971/70	1972/71
Private & Public Investment	7.3	7.8	7.0	6.5
Residential Construction	1.5	1.7	20.5	8.5
Machinery & Equipment	2.9	3.1	3.0	6.1
Non-Residential Construction	2.9	3.1	5.0	5.8

Source: Estimated by Economic Planning Branch, Department of Treasury and Economics. Calculations based on unrounded figures.

¹This figure includes family and senior citizens dwellings, but does not include student housing or public housing projects directly financed by CMHC or other agencies. Student housing units accounted for about 2400 units in 1971.

working age has increased sharply and will remain high for at least the next decade. A glance at historical data illustrates this. In 1956 young people between 15 and 25 years of age made up 21.4 per cent of the working-age population (14-65 years old). In 1970 their share increased to 27.9 per cent. In 1971 they constituted 28.1 per cent of the working-age population and 28.2 per cent is the expectation for 1972.

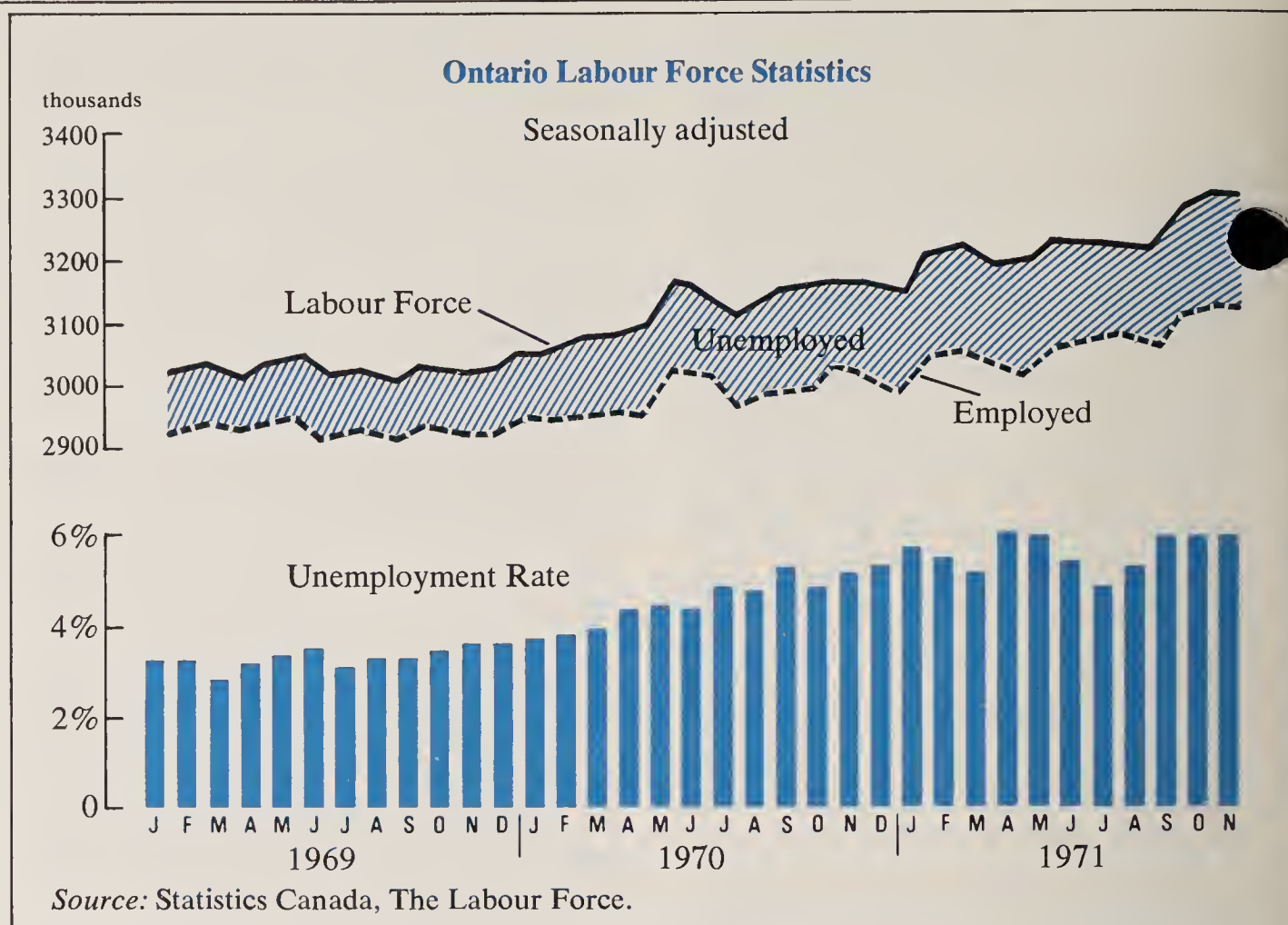
The sizable gap between labour force growth and the increase in new jobs available indicates poor prospects for improved labour market conditions in 1972, even if the economy picks up momentum. There is no doubt that the usual time-lag with which employment responds to the accelerated rate of economic growth will be longer, for the simple reason that there is still ample room for increases in output via increases in productivity of existing workers before it becomes necessary to increase employment.

Labour Force and Employment in 1972

It is expected that the labour force will grow by 3.4 per cent so that the total number of workers will reach 3,359,000. On the other hand, it is not unlikely that the increase in the labour force could be even greater. Expectations of a rather large, by historical standards, increase in the labour force are based on the following premises:

- 1) Increased numbers of young people entering the labour market.
- 2) Continuation of the steadily growing female participation in the labour force. The number of new female workers looking for jobs in 1972 is estimated at 36,000.
- 3) Continuation of the much higher than usual inflow of migrants into the province. It is estimated that the number of people from other provinces coming to live in Ontario tripled in 1969 and 1970, as jobs in Ontario were still relatively easier to find than in other provinces.
- 4) The new federal unemployment insurance plan coming into effect in January 1972 is very likely to encourage people with marginal labour force attachment to try to find employment.

It is expected that the number of jobs in 1972 will increase by 3.6 per cent (112,000 new jobs). Under these circumstances, the unemployment rate will be 5.0 per cent and the number of unemployed 168,000. It



should be noted that this takes into consideration the positive effect of the provincial government winter employment program designed to employ 42,000 workers as well as the effects of recent steps taken by the federal government. It is not unlikely, however, that the labour force increase may be higher and reach 3.6 per cent, which could mean 175,000 or 5.2 per cent of the workers unemployed, in which case no improvement in the unemployment picture will be obtained.

Youth Unemployment

Extremely high incidence of unemployment among young people has become a serious concern to the province. In 1970, over 40 per cent of the unemployed were young people. The unemployment rate for the 14-24 year-old group was 7.9 per cent as compared with 3.1 per cent for the 25-64 year-olds. The unemployment rate in Canada for the former age group was 10.3 per cent.

The unemployment rate for 14-19 year-olds in Ontario in 1970 was even higher, 10.8 per cent, or 24 per cent of all unemployed.

In 1971, the unemployment rate among young people was even higher, over 80,000 young workers or 47 per cent of the total unemployed. Considering the overall economic conditions as well as the situation in the job market in the coming year, it is

expected that about 85,000 young people will be without jobs in 1972.

Corporation Profits

Corporation profits before taxes have completely recovered from their dismal performance in 1970, increasing by 11 per cent in 1971. The further improvement of business conditions throughout 1972 will bring a strong increase in profits. Productivity gains and increased utilization of capacity will hold costs down, while sales will grow steadily. Under these circumstances profits in 1972 are forecast to increase 14 per cent over 1971.

Personal Income

Personal income, spurred on by large increases in wages and salaries, increased by a healthy 11.5 per cent in 1971. Average hourly earnings in Ontario manufacturing increased by 8.8 per cent which is about the same rate of increase as that in 1970, and up slightly from the 8.1 per cent increase in 1969.

It is expected that gains in wages and salaries will moderate somewhat in 1972, but personal income should increase by approximately 10.5 per cent.

Personal disposable income, the critical factor in consumer spending, should increase about 9.5 per cent.

The Input-Output Structure of The Niagara Region

S. M. Batrik, *Economist*

Department of Treasury and Economics

Regional development is mainly influenced by growth and changes in the provincial economy. Naturally, regions have grown and will continue to grow at different rates depending on their comparative capability to serve the national, provincial and local markets. In fact, determining the manner in which regions will react to a given set of economic stimulants or objectives is a major factor in making any regional projections. In recent years, rapid growth in population, industrialization and urbanization have necessitated the development of comprehensive economic models to cope with the complexity of modern economic structures. Reflecting this need, the Economic Analysis Branch of the Economic and Statistical Services Division has initiated the development of an input-output table for the Province of Ontario as an integral part of a system of provincial economic accounts.

In order to analyze the different economic structures and the concentration of industrial activities for the separate economic regions of Ontario, it was felt that regional inter-industry models should be constructed to supplement the model for the provincial economy.

The present study describes in detail the recently completed input-output table for the Niagara Region. This table portrays the regional economic structure in terms of the interindustry flows of goods and services and their interrelation with the final demand sector. The study is also designed to explore the extent to which this regional model can increase our analytical techniques for economic forecasting and identifying the key productive sectors of different regions.

Among the considerations influencing the choice of the Niagara Region is the fact that this area represents one of the major emerging corridors of North America and is within one of the most rapidly expanding industrial areas in Ontario.

The first part of this article outlines the conceptual framework of the Niagara input-output model and provides a concise exposition of the underlying methodology. In the second part, an attempt was made to apply the regional input-output model to estimate the regional income multipliers for different sectors and their effects in terms of income. The three basic tables — the transactions flow table, the direct requirements table and the total requirements table — are examined and presented in tabular form in the Ap-

pendix. The final section provides a summary of the statistical data sources and estimating procedures used in the construction of the model.

Regional Accounts and an Input-Output Table

An input-output table is considered to be an integral part of an economic and social accounting system.

Regional income accounts are concerned with the income and expenditure flows among producers, consumers and government. Moreover, these accounts show the relationship of the regional economy to that of other regions, and the amount of saving and investment taking place. According to an income accounting system, the transactions occurring in the economy during a certain period, conventionally one year, are classified to one of the three basic forms of economic activity — production, consumption, and accumulation. In an open economy it is necessary to add a fourth account containing transactions with the rest of the world.

Additional sub-accounts can be added, for example, the account relating to production can be subdivided so as to show separately the different activities which make up the productive sector as a whole. In this way a set of input-output accounts is introduced into the regional accounting framework to obtain a more detailed system of social accounting.

As the interindustry account is conceptually and statistically integrated with the regional income and product accounts, the value of gross regional product as well as the flows to each of the components of the final demand sector (government, household, etc.) is the same in the two sets of accounts.¹ However, in the input-output table both the final demand and the value-added components are distributed by sector of origin.

One major reason for constructing a regional table is to facilitate measuring the structural interdependence among different regions under study and the rest of the provincial (or national) economy. Moreover, such a table facilitates the co-ordination of regional statistics and provides a valuable tool for testing the consistency of the direct estimates of the regional gross products. The sectoral details provided by a regional input-output table facilitate a rational approach to the problems of locating public investment and establishing priorities for financial assist-

ance to the investment programs of the private sector.

THE NIAGARA INTERFLOW TABLE

Interindustry analysis was developed to measure how changes in one particular variable will affect the other variables in the system. A technical change in an industry — changes in the input mix used for the production of a particular commodity — will affect other industries which supply its raw materials. To account for these inter-relationships among different sectors of the economy, a proper industrial classification system must be established to identify certain relevant products with similar production functions. Therefore, products which have dissimilar production functions — even though they are substitutable — must be separately classified since a change in demand for them will have different effects on the economy.

The Niagara table divides the regional economy into 48 productive sectors: 43 manufacturing industries, mining, construction, trade, transportation and storage, services and agriculture and related agricultural activities. The work sheets upon which the final tables are based were originally developed for about 200 sectors.² This sectoral classification was chosen on the basis of the Standard Industrial Classification and the availability of data — especially on non-manufacturing sectors. Also it is based on the degree of importance of each sector to the regional economy. Finally, to maximize comparability between the regional and the provincial table it was desirable to choose a level of aggregation close to the provincial level.

Since geographical location does influence production processes, it was necessary to set up a regional interindustry table for the Niagara Region on the basis of direct and actual information on regional accounts, input structure and final demand patterns. Once these regional data are secured, the compilation of a regional input-output table does not differ much from the procedure usually followed in constructing a provincial or national interindustry table. The simplified version of the general input-output model — briefly outlined in the following section — must however be qualified, because the need for a detailed analysis of intra-regional and inter-regional relationships necessitates the introduction of some changes in the framework of the input-output accounting system.

¹There are, however, some differences between the two sets of accounts due to the different conceptual treatment of some items such as, interest paid or received, etc.

²This published version of the table represents

a condensation of a larger matrix consisting of 130 sectors. Under the Ontario Statistics Act, the table can be published only in aggregated form in order to comply with confidentiality requirements.

The reason for the direct approach in establishing a system of regional input-output accounts, rather than relying wholly or partially on the national or the provincial estimates, is that the purpose of this study is to prepare a tool for operational programming rather than theoretical manipulation. A regional model should throw light on the major characteristics of the region and differentiate both the technical structure and final demand patterns from those of the other regions and the provincial economy. Therefore, any attempt to construct a regional input-output table on the basis of the provincial or the national tables — as in the standard Leontief model — implies that input coefficients for the province are identical with those prevailing in the region and hence production processes are geographically invariant.

The compilation of an interflow table involves tracing the flows of different commodities to ultimate buyers, both for the purpose of intermediate and final consumption. Also it involves recording the inputs used by each productive sector. The work of constructing the original table was divided into four major stages:

1. Definition and measurement of the output of each sector in the regional economy. For some sectors sufficient data exist to allow direct estimation of gross output. For other sectors however, output data were not available and indirect estimating procedures were applied.
2. Estimation and allocation of inputs by sector. Inputs consist of raw materials and services — domestically produced and/or imported — used in the production process, and primary inputs such as labour and capital costs, etc. Since the information available on primary inputs pertains only to wages and salaries the other items were derived by using a residualling technique.
3. Estimation of final demand for the output of each sector by type of final user, including foreign demand in the form of exports. The export component of final demand consists of the Niagara Region's sales to the rest of Ontario, Canada, and the World.
4. Estimation of distributive costs for wholesale and retail trade, transportation and storage. For purposes of inter-industry analysis these costs or margins have to be shown separately in order that

the table may reflect a purely technical relationship among different sectors. In the producers' price system, each sector is treated as paying trade and transportation costs directly to the trade and transportation sector on all its purchases of inputs. Therefore, within the conceptual framework of this method, distribution costs are charged to the purchasers of commodities. Adopting this method of valuation — producers' prices — requires that the value of all inputs as recorded in the Census of Manufactures be adjusted accordingly. However, due to lack of information on distributive costs, it was assumed that the provincial ratios of the cost items to the purchaser values of each product — as derived from the Ontario Input-Output Table³ — are applicable to the Niagara Region.

Summary of the Standard I/O Technique

As mentioned above, interindustry analysis is mainly concerned with inter-relationships among different productive sectors of the economy. Therefore it is essentially a method of recording detailed statistical information in the form of a table or matrix. In order to understand the basic relationship of the standard input-output model, it is best expressed in algebraic formulas. If the flow of goods and services from sector i to sector j is indicated by x_{ij} , and the total output of sector i by x_i , then we have

$$x_i = \sum_{j=1}^n x_{ij} + d_i \quad (i = 1, \dots, n) \quad (1)$$

where d_i is the part of sector i 's output which is not absorbed by any of the n productive sectors. This is known as the final demand for the output of sector i , which consists of commodities delivered directly to consumers, government agencies, foreign firms, and to the business sector in terms of expenditure on investment goods. Since the interindustry flows x_{ij} are all regarded as current flows (not capital flows), investment goods supplied by any sector should be considered as a component of final demand. Of course, these capital goods have a dual function. They are part of the total expenditure during the year and they are also productive goods in the future. Since this model is a static one and does not take into account the time factor, the second function will be ignored and investment expenditure only will be considered as part of final demand.

The decomposition of (1) describes the total output of each sector as the sum of $n + 1$ non-negative components. In other words it deals with the output side of the transactions on each sector. On the input side of the transactions, the values x_{1j}, \dots, x_{nj} refer to the inputs purchased by sector j from each of the n sectors. In addition to these intermediate inputs, there are primary inputs, which are by definition, the flows of goods and services sold by economic agents outside the business sector. Wages and salaries, for example, are the amounts paid for labour services provided by hired workers. There is also depreciation on capital goods which is considered to be a service rendered by these capital goods, etc.

Total inputs of any sector can be presented by the following equation:

$$x_j = \sum_{i=1}^n x_{ij} + \sum_{h=1}^m Y_{hj} \quad (j = 1, \dots, n) \quad (2)$$

where Y_{hj} is the value of h^{th} primary input which is absorbed by sector j . On the left side of equation (2), we have the total input of sector j which is equal to the total output of the same sector.

The ratios of the interindustry flows x_{ij} and the primary input flows y_{hj} to total output x_j of the purchasing industry j can be written as:

$$a_{ij} = \frac{x_{ij}}{x_j} \quad (i, j = 1, \dots, n) \quad (3)$$

$$y_{hj} = \frac{Y_{hj}}{x_j} \quad \begin{matrix} (h = 1, \dots, m) \\ (j = 1, \dots, n) \end{matrix} \quad (4)$$

where a_{ij} represents the sectoral input coefficients (intermediate input coefficient), while y_{hj} represents the primary input coefficient (income coefficient).

On the assumption of fixed technical coefficients, each dollar's worth of output of sector j requires a fixed amount of a_{ij} dollars of output supplied by the i sectors to sector j .

From (1) and (3) we obtain:

$$x_i = \sum_{j=1}^n a_{ij} x_j + d_i \quad (i = 1, \dots, n) \quad (5)$$

In matrix form (5) can be written:

$$\mathbf{X} = \mathbf{A}\mathbf{X} + \mathbf{D} \quad (6)$$

$$(\mathbf{I} - \mathbf{A})\mathbf{X} = \mathbf{D} \quad \text{or} \quad (6a)$$

where \mathbf{X} is the n element column vector of total output by sectors; \mathbf{D} the vector of final demands, and \mathbf{A} is the $n \times n$ square matrix

³A detailed description of the method used for adjusting the table for these distributive costs is given in "The Input-Output Structure of the Ontario Economy," Ontario Economic Review, Vol. 8, No. 1.

of sectoral input coefficients. Assuming that $|I - A| \neq 0$ and premultiplying equation (6a) by $(I - A)^{-1}$ the solution of the model is given by:

$$X = (I - A)^{-1} D \quad (7)$$

There is stability in the sense that the technical coefficients remain fixed, the total output which is required to meet a given target of final demand can be estimated. However, the real world especially over a relatively long time period, does not conform to these stable relationships as described above. Therefore, any long-term forecasts have to be modified and adjusted to take this factor into account.⁴ The stability of the technical coefficients is governed not only by the state of technology prevailing during a certain time period but also by many other factors. Changes in relative prices, introduction of new products, the level of aggregation at which the interindustry table is constructed are all factors responsible for the variability in the input-output coefficients.

The basic equations of the input-output model can be summarized as:

$$\begin{aligned} E &= [(I - A)^{-1} - I] D \\ &= A (I - A)^{-1} D \end{aligned} \quad (8)$$

where

$$x_i - d_i = \sum_{j=1}^n x_{ij} \quad (i = 1, \dots, n)$$

From equation (8) one can compute a conditional forecast of the vector E_{t+m} of total intermediate demand by sectors in the year $t + m$ on the basis of a given vector of final demand D_{t+m} in year $t + m$ and the interindustry input coefficients matrix A_t of year t .

The other equation can be written in the form:

$$Y = y_{hj} (I - A)^{-1} D \quad (9)$$

or

$$Y = y_{hj} X$$

Given final demand D_{t+m} of that year and on the basis of A_t and the primary input coefficients matrix $y_{hj t}$ of the year t , equation (9) enables us to make a forecast of Y_{t+m} , total primary demand by each income category in year $t + m$ (in this model we have only two — wages and salaries, and other value added).

Equations 8 and 9 are considered to be the basic input-output forecasting equations. While the first equation deals with that part of the total output produced by each industry

and sold to the n sectors for further processing, the second deals with the total value of primary inputs absorbed by the n sectors.

Regional Income Effects of Changes in Demand

In this section, an attempt is made to compute the income effects in the Niagara Region resulting from changes in the final demand for the product of each sector in the regional economy. A change in demand for the product of one sector is diffused throughout the system and generates a chain-reaction in the rest of the economy. This diffusion effect is due to the interdependence which exists among different sectors. In a regional development context, these calculations are essential in identifying the key sectors in the region under study in terms of regional income generated, not only in the sector experiencing a change, but also in all other sectors related to it.

A given change in final demand for the product of any sector will generate different income effects in different sectors, depending on the degree of interdependence of that particular sector with other sectors. Therefore, a low degree of inter-relationship with other sectors in the economy will produce a small total income effect and vice versa. For example, the income coefficients in both the cotton, wool and synthetic textile and pulp and paper industries are the same but the total income effects of a change in demand for their output are different. A change of one dollar in final demand for the product of the cotton and wool industry will increase total income in the regional economy by approximately \$1.08. On the other hand, a similar change in the demand for pulp and paper products will generate about \$1.29 of income. This difference is due to the varying degree of interdependence among sectors. For the purpose of regional economic planning, it is not only necessary to determine the total income effects resulting from a given change in demand for the output of a particular sector but also necessary to estimate these effects on different income components, i.e. wages and salaries and subsequently value added. In the above example, an increase in demand for the products of the cotton and wool industry generate a larger income effect in terms of employment. Therefore, if increased employment in the region is the policy goal, the cotton and wool industry would be considered for stimulation in preference to the pulp and paper industry.

The effects of the induced changes in demand can be measured by using the technical coefficients and inverse matrices as derived from the input-output table for the Niagara Region. The initial impact of a change in final demand is a change in output by the sector directly affected and consequently a change in income (wages and salaries paid to labour and other investment income) originating in that sector. If the industry changes the level of its output by the same amount as the change in demand, the direct income effects can be calculated by using the technical coefficient matrix shown in Table 2. For example the direct income effect of an increase of one dollar in final demand for the products of the iron and steel industry will be .22 cents paid out in wages and salaries and .28 cents for other investment income. Hence, income originating in an industry is affected immediately by a rise in output.

This original increase in the output of a particular sector will generate certain changes in the demand for the products of other industries, which in turn will result in an increase in the output of the other Niagara Region industries that are directly or indirectly related to the industry experiencing the initial change in demand.

The following table shows the total income effects of a one dollar increase in final demand for the products of each sector in the regional economy. Direct effects are calculated by multiplying the original change in final demand by the income coefficients for wages and salaries, and other value added. Total income effects are computed by multiplying each row element of the inverse matrix of a particular industry by the corresponding income coefficient and summing the results. In computing the indirect impact on the total regional income, of a unit change in the iron and steel industry, we obtain:

$$\begin{aligned} &.023824 \times .423056 + .037203 \times .548588 \\ &+ \dots + .007669 \times .728210 + \\ &.051989 \times .0 = 2.499913. \end{aligned}$$

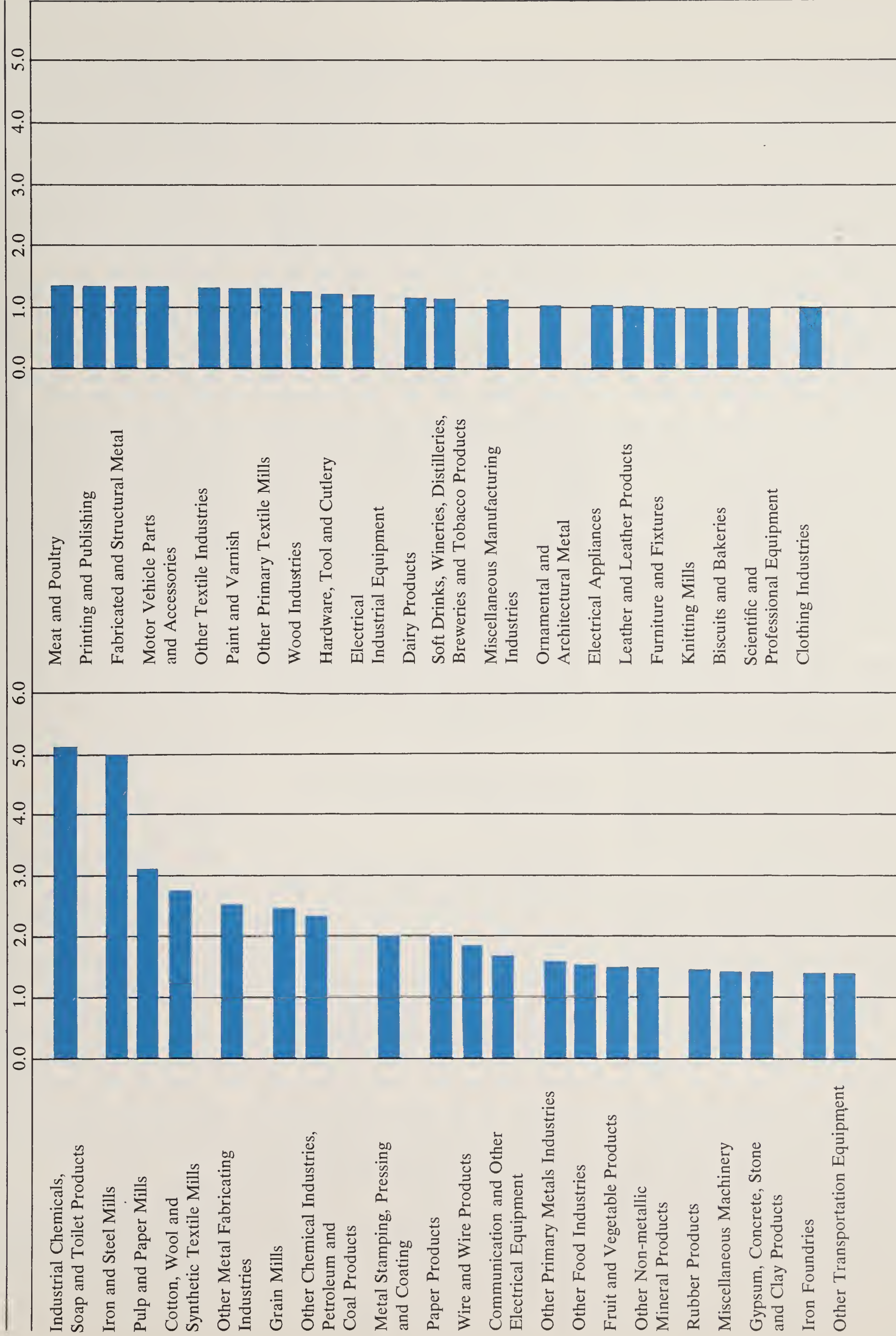
The income multiplier, (column 4 of the following table) shows how much total regional income will rise per unit increase in income of the industry named at the left, assuming all other final demand remains constant. In other words, each entry shows the total Niagara income change associated with a unit income change in the industry listed at the left.

⁴In a forthcoming article, the stability of the technical coefficients of the Ontario input-output structure will be examined. This study will enhance the long-term forecasting capabilities of the present input-output model.

Table 1 — Income Effects Generated by a One-Dollar Increase in Final Demand, Niagara Region, 1967

I-O No.	Industry	Wages and Salaries	Other Value Added	Total	Income Multiplier
3	Meat and Poultry	.154367	.076313	.230680	1.317854
4	Dairy Products	.285678	.026899	.312577	1.141013
5	Fruit and Vegetable Products	.276348	.164626	.440974	1.522290
6	Grain Mills	.280228	.193253	.473481	2.466173
7	Biscuits and Bakeries	.337496	.086102	.423598	1.019453
8	Other Food Industries	.172804	.135168	.307972	1.616424
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.214469	.279530	.493999	1.140388
10	Rubber Products	.284199	.377410	.661609	1.482353
11	Leather and Leather Products	.349778	.016378	.366156	1.049751
12	Cotton, Wool and Synthetic Textile Mills	.706683	.377922	1.084605	2.690871
13	Other Primary Textile Mills	.290115	.176747	.466862	1.220570
14	Other Textiles Industries	.278747	.119451	.398198	1.265302
15	Knitting Mills	.312467	.063422	.375889	1.037939
16	Clothing Industry	.338629	.156210	.494839	1.007893
17	Wood Industry	.319472	.142940	.462412	1.196814
18	Furniture and Fixtures	.226338	.078746	.305084	1.048887
19	Pulp and Paper Mills	.848733	.437578	1.286311	3.108563
20	Paper Products	.446392	.233808	.680200	2.025691
21	Printing and Publishing	.537596	.248170	.785766	1.313518
22	Iron and Steel Mills	1.596281	.903632	2.499913	5.007121
23	Iron Foundries	.329839	.160203	.490042	1.333821
24	Other Primary Metals Industries	.379359	.191086	.570445	1.672935
25	Fabricated and Structural Metal	.381903	.049236	.431139	1.289463
26	Ornamental and Architectural Metal	.245954	.068566	.314520	1.057915
27	Metal Stamping, Pressing and Coating	.426525	.221458	.647983	2.038992
28	Wire and Wire Products	.420406	.210050	.630456	1.885401
29	Hardware, Tool and Cutlery	.385076	.096260	.481336	1.176723
30	Other Metal Fabricating Industries	.696158	.298962	.995120	2.523637
31	Miscellaneous Machinery	.330329	.108827	.439156	1.358303
32	Motor Vehicle Parts and Accessories	.379750	.200173	.579923	1.285878
33	Other Transportation Equipment	.359021	.136844	.495865	1.327743
34	Electrical Appliances	.226973	.104180	.331153	1.056686
35	Electrical Industrial Equipment	.400939	.307926	.708865	1.171310
36	Communication and Other Electrical Equipment	.450395	.222396	.672791	1.679909
37	Gypsum, Concrete, Stone and Clay Products	.340448	.243098	.583546	1.355043
38	Other Non-metallic Mineral Products	.458560	.184539	.643099	1.512388
39	Paint and Varnish	.218435	.024501	.242936	1.248060
40	Industrial Chemicals, Soap and Toilet Products	.598833	.319580	.918413	5.093202
41	Other Chemical Industries, Petroleum and Coal Products	.233159	.156318	.389477	2.343671
42	Scientific and Professional Equipment	.340165	.113643	.453808	1.013233
43	Miscellaneous Manufacturing Industries	.393925	.295860	.689785	1.500000

Diagram () Income Multipliers Induced by One-Dollar Change in Income, Niagara Region, 1967
(Dollar Value)



Calculation of the results shown in the preceding table can be summarized by the following equations:

$$T_j = W_j + V_j \quad (j = 1, \dots, n) \quad (10)$$

where T_j , W_j , V_j stand for total regional income, wages and other income generated respectively by a dollar increase in the final demand of sector j . The W_j 's are generated in the following manner:

$$W_j = \mathbf{w}(\mathbf{I} - \mathbf{A})^{-1} \mathbf{e} \quad (j = 1, \dots, n) \quad (11)$$

where \mathbf{w} is a row vector of wage shares per dollar of output for each sector and \mathbf{e} is the standard base vector with zeros everywhere except in the j^{th} position where it is equal to one. Similarly V_j is calculated as follows:

$$V_j = \mathbf{v}(\mathbf{I} - \mathbf{A})^{-1} \mathbf{e} \quad (j = 1, \dots, n) \quad (12)$$

where \mathbf{v} is a row vector of non-wage income per dollar of output in each sector.

From (10), (11) and (12) it is easily seen that

$$T_j = (\mathbf{w} + \mathbf{v})(\mathbf{I} - \mathbf{A})^{-1} \mathbf{e} \quad (j = 1, \dots, n) \quad (13)$$

The income multiplier K_j is estimated according to the following equation:

$$K_j = T_j / (W_j + V_j) \quad (j = 1, \dots, n) \quad (14)$$

A change of unit income represents varying changes in the total output of each industry. For example, a one million dollar direct change in income in the wire and wire products industry (Sector No. 28) would require a change in total output of that industry of about 4.35 million dollars — the reciprocal of the income coefficient — while a similar change in motor vehicle parts and accessories would require a total output change of about two million dollars.

Diagram 2, on the other hand, shows the the Niagara Region in terms of total regional income induced by a one dollar change in income in any particular sector. The highest income multipliers are for those sectors with higher degrees of interdependency. On this basis industrial chemicals, Iron and Steel Mills, Pulp and Paper Industries, are evidently considered key sectors in the regional economy.

Diagram 2, on the other hand, shows the total income effects generated by a one dollar increase in final demand for the product of each sector. This income effect is shown in terms of wages and salaries and other value added. According to this Diagram, Iron and Steel Mills have the highest effects in terms of both components of value added.

So far, it has been assumed that all other final demand components will not be affected by changes in income. Regardless of the limitation, these calculations still throw some light on the magnitude and the direction of particular effects due to certain changes in one of the exogenous variables in the model. The other implicit assumptions of this model are; first, the acceleration effect — the effect of a change in demand on investment expenditures — is zero. In other words, changes in any of the final demand components will not lead to certain modifications in investment expenditure plans of business sectors; second, the initial increase or decrease in production and income will not lead to any substantial changes in personal consumer expenditures. However, the validity of the present analysis and the estimation of income multipliers depends on the essential assumption that initial changes in any of the final demand components are of relatively small magnitude and will not affect substantially the other components of final demand.

To account for these factors, a dynamic feature has to be built into the interindustry model. The statistical requirements for such adjustments are not available at the present time. However, the Economic Analysis Branch is now constructing a capital expenditure matrix which will enhance the usefulness of the present model and increase the accuracy of the statistical results.

DEFINITIONS OF OUTPUT AND ALLOCATION OF INPUTS BY SECTOR

Agriculture

Agriculture is the most important primary activity in the Niagara Region. However, the relative importance of this sector is declining due to rapid urbanization. In Ontario, from 1951 to 1961, the agricultural labour force declined by approximately 16 per cent, whereas in the Niagara Region it declined by about 35 per cent. In order to serve the demands of the growing urban population, it has been necessary to intensify agricultural operations since more than 20 per cent of the improved farmland was converted to other land uses, i.e., residential, industrial, etc. As a result, the number of farms has declined by about 27 per cent, while the market value of land and buildings has increased over twofold.

For the purpose of interindustry analysis, the total value of agricultural output is de-

fined to include cash receipts from the sale of farm products, value of income in kind — the imputed value of agricultural commodities produced and consumed on the farm — and the value of changes in field crops and livestock inventories. In spite of the fact that many of these data are available at the provincial level, there are no comparable statistics for the regions. The Ontario Department of Agriculture and Food, however, publishes statistics on farm value of agricultural products by county. From this information the ratio of the Niagara Region to the province was derived. Then, by applying this ratio to Ontario's farm cash receipts from farming operations, a total for farm cash receipts in the Niagara Region was derived. Due to lack of information on other components of agricultural output — as defined above — it was assumed that the regional changes in inventories and income in kind represent the same proportion of total cash receipts as in the province. Accordingly, the estimated total value of agricultural output in the Niagara Region during 1967 was about \$198 million.

To estimate the total value of inputs — both intermediate and primary, the provincial technical coefficients — as derived from the Ontario Input-Output Table were assumed to apply to Niagara's agricultural sector. This assumption can be relaxed and more accurate estimates of total agricultural inputs and their components can be derived when more data become available.

Forestry and Fisheries

Forestry in the Niagara Region is of minor importance, and has a negligible annual value of output. The control total for the value of output of the fishing industry was estimated on the basis of data published annually in the Statistics Canada Bulletin *Fisheries Statistics*, and Ontario Department of Lands and Forests statistics for provincial fishing districts.

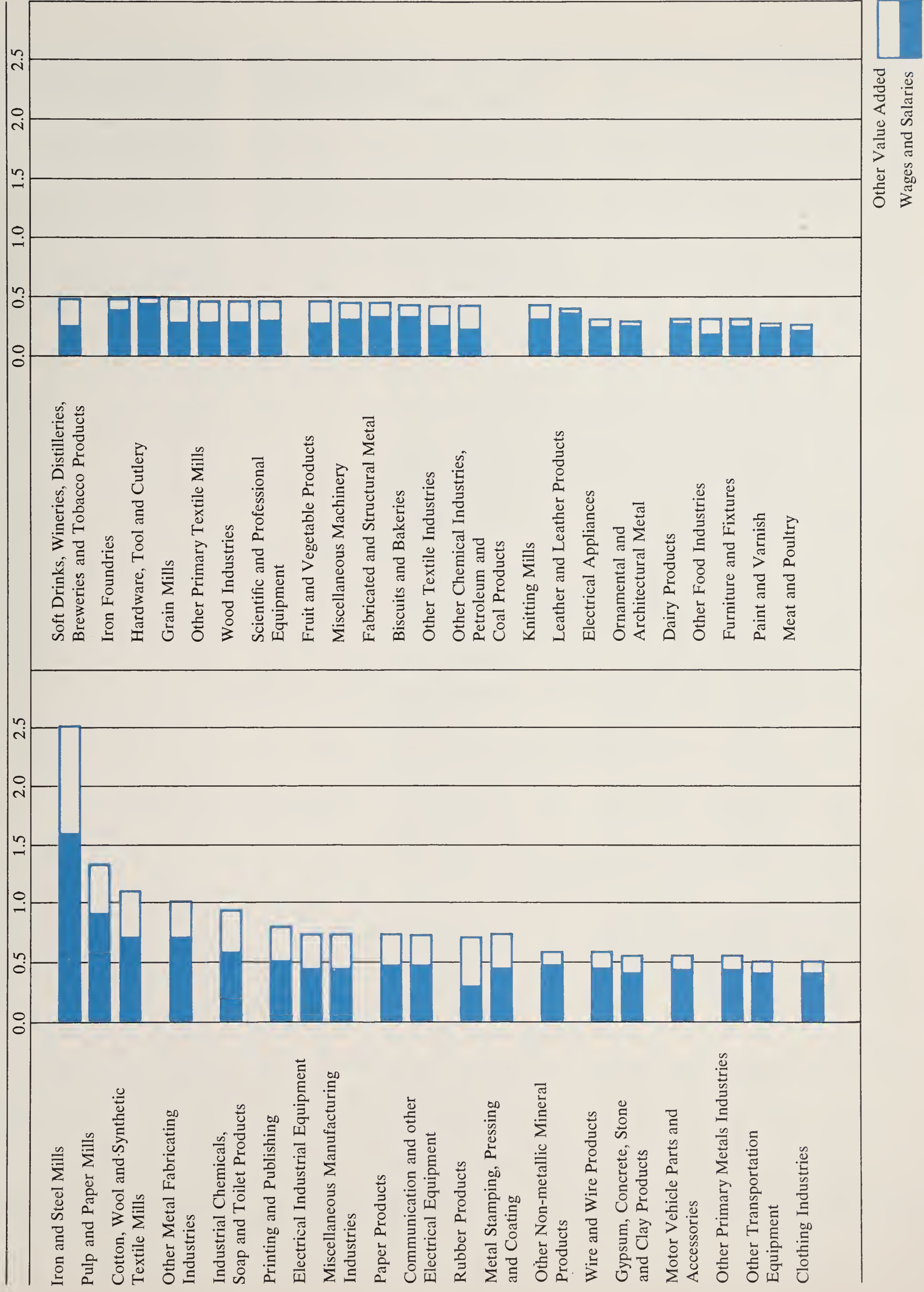
The value of output of the trapping industry was estimated on the basis of provincial statistics pertaining to the value of fur pelts.

Provincial input coefficients were applied to estimate the distribution of total value of input used during the year 1967 in the production process of this sector.

Mining

Mining industries represent the second major primary activity in the Niagara Region. Mineral products produced in the region in 1967

Diagram 2 Income Effects Generated by One-Dollar Increase in Final Demand in the Niagara Region, 1967
(Dollar Value)



made up about 3 per cent of the total value of provincial mineral output. The region produces almost 100 per cent of Ontario's gypsum, 25 per cent of its natural gas and approximately 13 per cent of its structural materials. The value of mineral products produced during 1967 reached a total of about 20.7 million dollars, an increase of 42 per cent over the 1961 level. The mining industries contribution to employment in the Niagara Region is quite small since mining employs only about 0.3 per cent of the total regional labour force.

The principal source of data on mining industries in the Niagara Region is the annual Census of Mines compiled by Statistics Canada. The data contained in the census questionnaires are compiled on an establishment basis, and through the co-operation of the Ontario Statistical Centre different mining establishments operating in the Niagara Region were identified and aggregated. This information on mineral production in the Niagara Region was supplemented by other commodity schedules prepared by Statistics Canada and some estimates made available by the Ontario Department of Transportation and Communications on the volume and cost of sand and gravel and limestone bought from various establishments which are not included in the Annual Census of Mines.

Other data provided by these commodity schedules are mineral products produced as secondary products by other industries. These data were incorporated in the secondary products matrix for all industries operating in the Niagara Region. Finally, the value of output of the mineral fuel industry in the region was derived from statistics published by the Department of Mines and Northern Affairs on the production of crude oil and natural gas.

The allocation of total inputs of the mining industries in the region was made on the basis of information pertaining to raw materials and supplies purchased by the mining establishments derived by the 1967 Annual Census of Mining.

Manufacturing

The principal data source on manufacturing was the 1967 Annual Census of Manufactures for the Province of Ontario compiled by Statistics Canada on an establishment basis. The Summary Schedule available for each establishment provides information on raw materials, supplies, purchased components, semi-processed goods, and fuel and

electricity used in the production process during the year. In addition, each schedule contains data on value of shipments, changes in inventories of raw materials, finished goods and goods in process and the value of wages and salaries. However, such detailed information is not equally available for all industries due to the reporting system on which the census is based. For example, small establishments are required to report only totals for raw materials purchased and goods shipped.

For the purpose of setting up the inter-

industry table for the manufacturing industries in the Niagara Region, only the establishments which operate in the region were classified according to the Standard Industrial Classification. There were about 1,356 manufacturing establishments operating in the Niagara Region in 1967. The first step in constructing the regional interindustry flow table for this sector required determination of control totals for the value of output produced, and inputs used by each industry.

The following table shows the definition and derivation of various control totals for

Table 2 — Iron and Steel Mills, 1967 (SIC: 2910)
(\$000)

	Sub-total	Total
(I) Value of Production:		
(A) Value of Shipments (at Factor Cost)		
Primary Products	767,258	
Secondary Products	23,188	
Amount Received for Work Done	2,840	
Total	793,286	
Less Adjustments	—1,240	
(B) Adjusted Value of Shipments and Work Done	792,046	
(C) Value of Fixed Assets Produced	2,491	
(D) All Other Revenues (Including Sales of Electricity)	211	
(E) \pm Changes in Inventories	+973	
Total Value of Production	795,721	795,721
(II) Intermediate Inputs (at Market Price):		
(A) Cost of Materials		
Supplies and Materials	288,908	
Fuel	18,195	
Purchased Electrical Energy	13,264	
Cost of Contract Work	2,179	
Maintenance and Repair	50,824	
Others	919	
Cost of Machinery and New Building	62	
Total	374,351	
(B) Total Cost of Services	23,055	
Total Intermediate Inputs	397,406	397,406
(III) Total Wages and Salaries	178,681	
(IV) Other Primary Inputs	219,634	
(V) Value Added (at Factor Cost)	398,315	398,315

the Iron and Steel Industry (sector No. 22), since the Census of Manufactures records only show the value of shipments. It was therefore necessary to adjust these figures for changes in inventories of finished goods and goods in process accrued during the year 1967, while further adjustments were required to exclude the value of products purchased and resold without further processing. On the input side, the census does not provide the total cost of services used by each industry. Hence, these costs were estimated by applying the provincial input coefficients as derived from the Ontario Input-Output Table.

Since census information is compiled on an establishment basis additional problems were encountered classifying commodities on the basis of the Standard Industrial Classification. In addition to their principal products, establishments within an industry may produce secondary products which are considered, in an interindustry context, primary to other industries. The difference between the industrial classification used in the census and the input-output concept necessitates the identification and reclassification of industrial output and subsequent reallocation to the appropriate industry.

The Niagara Region, however, does not provide a full industrial representation, in other words, not all industries operating in the province are represented in the region. The absence of some industries creates a problem in the treatment of secondary products. Since the value of the secondary products of Niagara industries constitute an insignificant part of the total output of each industry, it was decided to disregard the process of reallocating them.

The second step in the analysis of the manufacturing sectors involved the construction of a matrix showing the flows of input items purchased and used by each industry in the production process. For most industries, a detailed breakdown of raw materials and fuel and electricity purchased is available from the 1967 Annual Census of Manufactures. A supplementary listing of all other raw materials and containers used compiled by the Ontario Statistical Centre from establishment reports reduced the value of items which could not be allocated to a specific industry-of-origin. The remaining unallocated value was distributed in the same manner as that in the census questionnaires.

Table 3 – Ranking of Manufacturing Industries by Level of Total Output Produced, Niagara Region, 1967
(Valued at Producers' Prices in \$000)

Rank	I-O No.	Industry	Total Output	Percentage Distribution
1	22	Iron and Steel Mills	797,053	23.6
2	32	Motor Vehicle Parts and Accessories	248,245	7.4
3	40	Industrial Chemicals, Soap and Toilet Products	228,838	6.8
4	30	Other Metal Fabricating Industries	222,208	6.6
5	31	Miscellaneous Machinery	200,011	5.9
6	24	Other Primary Metals Industries	113,709	3.4
7	28	Wire and Wire Products	106,502	3.2
8	10	Rubber Products	97,212	2.9
9	19	Pulp and Paper Mills	95,506	2.8
10	27	Metal Stamping, Pressing and Coating	89,526	2.7
11	35	Electrical Industrial Equipment	87,865	2.6
12	33	Other Transportation Equipment	81,309	2.4
13	38	Other Non-metallic Mineral Products	76,405	2.3
14	5	Fruit and Vegetable Products	65,017	1.9
15	34	Electrical Appliances	61,451	1.8
16	20	Paper Products	57,733	1.7
17	37	Gypsum, Concrete, Stone and Clay Products	55,535	1.6
18	41	Other Chemical Industries, Petroleum and Coal Products	52,052	1.5
19	6	Grain Mills	51,836	1.5
20	3	Meat and Poultry	46,806	1.4
21	12	Cotton, Wool and Synthetic Textile Mills	45,888	1.4
22	8	Other Food Industries	45,222	1.3
23	25	Fabricated and Structural Metal	42,404	1.3
24	36	Communication and Other Electrical Equipment	40,967	1.2
25	23	Iron Foundries	38,800	1.2
26	21	Printing and Publishing	37,301	1.1
27	13	Other Primary Textile Mills	36,926	1.1
28	43	Miscellaneous Manufacturing Industries	35,329	1.0
29	9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	33,787	1.0
30	4	Dairy Products	30,035	0.9
31	15	Knitting Mills	19,572	0.6
32	29	Hardware, Tool & Cutlery	19,120	0.6
33	17	Wood Industries	17,504	0.5
34	16	Clothing Industries	17,486	0.5
35	26	Ornamental and Architectural Metal	17,457	0.5
36	7	Biscuits and Bakeries	17,080	0.5
37	18	Furniture and Fixtures	15,588	0.5
38	39	Paint and Varnish	9,798	0.3
39	14	Other Textile Industries	8,160	0.2
40	11	Leather and Leather Products	7,348	0.2
41	42	Scientific and Professional Equipment	2,399	0.1
Total			3,372,990	100.0

Construction

The construction sector for the regional inter-industry table includes all construction work performed in the Niagara Region during 1967 and carried out either by the construction industry proper or by the labour force of other industries. New construction consists of all new work put in place, including additions, major renovations, conversions and alterations where either structural change takes place or the life of an existing asset is extended. On the basis of this definition a control total for new construction for the year 1967 in the Niagara Region was estimated. The Statistics Canada publication, *Private and Public Investment in Canada*, shows the location of new construction only by province. Consequently, published statistics on the value of building permits issued in the province by economic region as well as type of construction, were used as a basis for estimating the total value of construction at the regional level. This method of estimation is justified by the fact that almost 70 per cent of the total value of construction work reported for the province in 1967 consists of residential construction and repairs.

Finally, due to lack of data on the cost structure of the construction sector at the regional level, it was assumed that the provincial input coefficients — as shown in the Ontario Input-Output Table — apply to the Niagara Region.

Services

Due to lack of information, at the regional level on the service industries, it was necessary to adopt an indirect estimating procedure. The service industries encompass financial intermediaries, repair, amusement, recreational, health, education, personal business and welfare services. The control total for the value of output of the service sector was estimated by assuming that the provincial ratio of the output of services to gross provincial product for the year 1967, applies to the Niagara Region. The final step in the analysis of the service industries was the estimation of total intermediate inputs and their sectoral allocation within the Niagara input-output classification. This was done by using the input coefficients as derived from the Ontario Input-Output Table.

Transportation, Storage and Trade

The value of output of the trade sector is defined as the trade mark-up. On the other

hand, the transportation and storage sector is defined as including all transportation and storage establishments. The output of this sector represents the total revenue derived from transporting Niagara's output to users either within or outside the region. Since adequate information for estimating the regional output of these industries is not available, the provincial trade and transportation mark-ups derived from the Ontario Input-Output Table were applied to Niagara Input-Output Table, valued at purchasers' prices. This method serves a dual purpose: it facilitates the revaluation of each table entry from purchasers' to producers' prices and simultaneously permits estimation of the inputs of this sector into each industry of the regional economy.

Treatment of Regional Imports

One of the major problems to be solved before constructing a regional input-output table, is deciding on the method by which the value of exports and imports of the region will be estimated. According to the standard Leontief open model, exports are treated as autonomous elements of final demand while imports of intermediate products are estimated on the basis of fixed ratios of the inputs to the level of total output of each sector.

Due to lack of statistical information on interregional and international trade flows, an indirect estimating procedure was adopted to derive the value of regional exports and imports by sector. The first step was to derive the trade balance for each sector. This trade balance represents the deficit or surplus of the domestic output produced by each sector to meet the direct and indirect requirements of the regional economy. In other words, it is the difference between the total output requirement — intermediate plus final demand — and the actual output produced by each sector. A positive trade balance for any sector indicates that the region is a net exporter of the product of that sector, whereas a negative value shows that the region is a net importer.

After determining the trade balance by sector, the next step is to distribute proportionately the negative values — or net imports — across each row and reduce the value of intermediate demand in each sector by the same amount. This derived imports matrix

was reduced to a row vector which represents the total imported intermediate inputs used in the production process of each sector, (Row No. 49 of Table 2 in the Appendix).

The implicit assumption is that input requirements will be satisfied first from domestically produced goods to the extent that regional output is available. It is also assumed that Niagara's local products have a locational advantage over imported materials. On the other hand, if the Niagara output of a particular product is not sufficient to meet regional needs, each sector will distribute its input requirements proportionately between domestic output and importation of this product.

Final Demand

The final demand component consists of that part of the total output of each sector which is allocated outside of the productive sectors of the economy and is consumed. In other words, the final demand sector encompasses all demand which is not accounted for through the input requirements computed from the given set of input coefficients. As mentioned above, this sector consists of personal consumer expenditure on goods and services, gross regional capital formation, changes in inventories, government expenditure (current account) at three levels — federal, provincial and municipal, and finally regional exports to the rest of Canada and the world. Due to lack of data on different final demand categories at the regional level, it was decided to estimate their control totals on the basis of the input-output table for the province. After gross regional product was estimated for the Niagara Region it was distributed among the different final demand categories — except for regional exports — by applying the same percentage distribution as for the gross provincial product.

The sectoral allocation to each category of the final demand sector was approximated by applying the corresponding pattern derived from the provincial input-output table. Because the final demand sector is considered as the exogenous variable in the model and does not influence the technical structure of the regional economy, this estimating procedure will not introduce a major distortion to the basic model. However, when more accurate information becomes available, it can be easily incorporated into the model.

Table 4 — Total Intermediate Domestic Input as a Percentage of Total Input, Niagara Region, 1967
(Valued at Producers' Prices in \$000)

Industry No.	Industry	Total Intermediate Domestic Input Less		Per Cent
		Intra-Industry Input	Total Input	
1	Agriculture, Forestry and Fishing	81,813	198,834	41.14
2	Mining	7,122	20,746	34.32
3	Meat and Poultry	32,077	46,806	68.53
4	Dairy Products	19,719	30,035	65.65
5	Fruit and Vegetable Products	33,959	65,017	52.23
6	Grain Mills	36,155	51,836	69.74
7	Biscuits and Bakeries	8,073	17,080	47.26
8	Other Food Industries	30,916	45,222	68.36
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	12,589	33,787	37.25
10	Rubber Products	28,245	997,212	29.05
11	Leather and Leather Products	2,391	7,348	32.53
12	Cotton, Wool and Synthetic Textile Mills	6,392	45,888	13.92
13	Other Primary Textile Mills	10,741	36,926	29.08
14	Other Textile Industries	3,056	8,160	37.45
15	Knitting Mills	9,486	19,572	48.46
16	Clothing Industries	7,463	17,486	42.67
17	Wood Industries	4,198	17,504	23.98
18	Furniture and Fixtures	8,590	15,588	55.10
19	Pulp and Paper Mills	19,731	95,506	20.65
20	Paper Products	32,118	57,733	55.63
21	Printing and Publishing	12,142	37,301	32.55
22	Iron and Steel Mills	139,390	797,053	17.48
23	Iron Foundries	22,022	38,800	56.75
24	Other Primary Metals Industries	61,864	113,709	54.40
25	Fabricated and Structural Metal	27,007	42,404	63.68
26	Ornamental and Architectural Metal	10,505	17,457	60.17
27	Metal Stamping, Pressing and Coating	54,995	89,526	61.42
28	Wire and Wire Products	46,654	106,502	43.80
29	Hardware, Tool and Cutlery	8,220	19,120	42.99
30	Other Metal Fabricating Industries	115,386	222,208	51.92
31	Miscellaneous Machinery	119,077	200,011	59.53
32	Motor Vehicle Parts and Accessories	98,440	248,245	39.65
33	Other Transportation Equipment	29,998	81,309	36.89
34	Electrical Appliances	33,719	61,451	54.87
35	Electrical Industrial Equipment	27,657	87,865	31.47
36	Communication and Other Electrical Equipment	10,782	40,967	26.31
37	Gypsum, Concrete, Stone and Clay Products	19,716	55,535	35.50
38	Other Non-metallic Mineral Products	24,620	76,405	32.22
39	Paint and Varnish	5,130	9,798	52.35
40	Industrial Chemicals, Soap and Toilet Products	97,272	228,838	42.50
41	Other Chemical Industries, Petroleum and Coal Products	35,557	52,052	68.31
42	Scientific and Professional Equipment			
43	Miscellaneous Manufacturing Industries	14,135	35,329	40.00
44	Construction, Maintenance and Repair	168,061	450,595	37.29
45	Transportation, Storage and Trade	137,771	681,536	20.21
46	Utilities	14,968	134,929	11.29
47	Communications and Other Services	150,578	1,137,387	13.23
48	Unallocated Sector	246,582	320,325	76.97

In this table, total intermediate input is defined to exclude intra-industry consumption.

Table 5 — Total Intermediate Demand as a Percentage of Total Output, Niagara Region, 1967
(Valued at Producers' Prices in \$000)

Industry No.	Industry	Total Intermediate Demand	Total Output	Per Cent
1	Agriculture, Forestry and Fishing	135,876	198,834	68.33
2	Mining	10,525	20,746	50.73
3	Meat and Poultry	13,072	46,806	27.92
4	Dairy Products	10,689	30,035	35.58
5	Fruit and Vegetable Products	20,350	65,017	31.29
6	Grain Mills	35,056	51,836	67.62
7	Biscuits and Bakeries	3,584	17,080	20.98
8	Other Food Industries	19,070	45,222	42.16
9	Soft Drinks, Wineries, Breweries, Distilleries and Tobacco Products	5,544	33,787	16.40
10	Rubber Products	30,461	97,212	31.33
11	Leather and Leather Products	843	7,348	11.47
12	Cotton, Wool and Synthetic Textile Mills	35,756	45,888	77.92
13	Other Primary Textile Mills	5,936	36,926	16.07
14	Other Textile Industries	5,107	8,160	62.58
15	Knitting Mills	683	19,572	3.48
16	Clothing Industries	410	17,486	2.34
17	Wood Industries	13,878	17,504	79.28
18	Furniture and Fixtures	842	15,588	5.40
19	Pulp and Paper Mills	71,235	95,506	74.58
20	Paper Products	40,929	57,733	70.89
21	Printing and Publishing	32,888	37,301	88.16
22	Iron and Steel Mills	390,213	797,053	48.95
23	Iron Foundries	38,662	38,800	99.64
24	Other Primary Metals Industries	51,073	113,709	44.91
25	Fabricated and Structural Metal	25,948	42,404	61.19
26	Ornamental and Architectural Metal	6,057	17,457	34.69
27	Metal Stamping, Pressing and Coating	44,880	89,526	50.13
28	Wire and Wire Products	47,430	106,502	44.53
29	Hardware, Tool and Cutlery	12,297	19,120	64.31
30	Other Metal Fabricating Industries	116,612	222,208	52.47
31	Miscellaneous Machinery	19,855	200,011	9.92
32	Motor Vehicle Parts and Accessories	28,247	248,245	11.37
33	Other Transportation Equipment	19,268	81,309	23.69
34	Electrical Appliances	1,975	61,451	3.21
35	Electrical Industrial Equipment	17,005	87,865	19.35
36	Communication and Other Electrical Equipment	17,254	40,967	42.11
37	Gypsum, Concrete, Stone and Clay Products	38,092	55,535	68.59
38	Other Non-metallic Mineral Products	25,679	76,405	33.60
39	Paint and Varnish	8,652	9,798	88.30
40	Industrial Chemicals, Soap and Toilet Products	108,229	228,838	77.29
41	Other Chemical Industries, Petroleum and Coal Products	30,106	52,052	57.83
42	Scientific and Professional Equipment	734	2,399	30.59
43	Miscellaneous Manufacturing Industries	10,586	35,329	29.96
44	Construction, Maintenance and Repair	86,734	450,595	19.24
45	Transportation, Storage and Trade	238,693	681,536	35.02
46	Utilities	74,522	134,929	55.23
47	Communications and Other Services	361,726	1,137,387	31.80
48	Unallocated Sector	260,272	320,325	81.25

CONCLUSION

The interindustry model of the Niagara Region, as presented in this article, is considered to be a step further toward regionalization of the input-output model for the provincial economy. Without relying on any disaggregating method based on the technical structure of the provincial or national economy, this table was constructed on the basis of direct and actual data on the regional input structure and final demand patterns. It is believed that this model, based on actual information, will provide a more reliable

foundation for impact analysis and studies of differential growth rates in the various regions than could be achieved using purely statistical disaggregation procedures.

The Niagara interflow table reveals in detail the complex industrial structure of the region where all major types of productive activity are represented. The intricate interdependence among various sectors is due to the fact that a great number of transactions are taking place between the productive sectors rather than between these industries and

the final demand sectors. Table (5) shows that more than 20 major industries delivered more than 40 per cent of their output to other industries for further processing. Moreover, a relatively large proportion of total inputs were supplied from domestic sources.

This model will be used in analyzing the structure of the regional economy and its market potential for different products and will provide a basis for a more rational approach for solving problems relating to public investment programs.

Table I – The Inter-Industry Flow of Goods and Services, Niagara Region, 1967
(Producers' Prices in Thousands of Dollars)

Industry No.	Industry	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products
	For the distribution of output of an industry, read the row for that industry.				
	For the composition of inputs to an industry, read the column for that industry.				
	Industry	1	2	3	4
1	Agriculture, Forestry and Fishing	18,281	0	26,775	16,537
2	Mining	0	40	3	1
3	Meat and Poultry	0	0	2,664	0
4	Dairy Products	0	0	0	1,017
5	Fruit and Vegetable Products	0	0	810	73
6	Grain Mills	28,669	0	24	0
7	Biscuits and Bakeries	0	0	0	1
8	Other Food Industries	340	0	132	53
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	0	0	0	0
10	Rubber Products	1,282	0	0	0
11	Leather and Leather Products	0	0	0	0
12	Cotton, Wool and Synthetic Textile Mills	3	0	0	0
13	Other Primary Textile Mills	958	0	0	0
14	Other Textile Industries	10	0	0	0
15	Knitting Mills	0	0	0	0
16	Clothing Industries	0	0	0	0
17	Wood Industries	465	0	1	0
18	Furniture and Fixtures	0	0	0	0
19	Pulp and Paper Mills	0	0	10	0
20	Paper Products	146	0	606	701
21	Printing and Publishing	0	0	97	0
22	Iron and Steel Mills	0	1	0	0
23	Iron Foundries	0	0	0	0
24	Other Primary Metals Industries	0	0	0	0
25	Fabricated and Structural Metal	0	0	0	0
26	Ornamental and Architectural Metal	467	0	0	0
27	Metal Stamping, Pressing and Coating	1	1	472	8
28	Wire and Wire Products	576	0	0	0
29	Hardware, Tool and Cutlery	20	0	0	0
30	Other Metal Fabricating Industries	395	1,549	0	0
31	Miscellaneous Machinery	2,944	1	0	0
32	Motor Vehicle Parts and Accessories	0	494	0	0
33	Other Transportation Equipment	62	0	0	0
34	Electrical Appliances	0	0	0	0
35	Electrical Industrial Equipment	0	0	0	0
36	Communication and Other Electrical Equipment	70	0	0	0
37	Gypsum, Concrete, Stone and Clay Products	0	86	0	0
38	Other Non-metallic Mineral Products	0	0	0	94
39	Paint and Varnish	0	0	0	0
40	Industrial Chemicals, Soap and Toilet Products	1,664	3	9	8
41	Other Chemical Industries, Petroleum and Coal Products	8,380	96	255	7
42	Scientific and Professional Equipment	0	0	0	0
43	Miscellaneous Manufacturing Industries	19	0	0	0
44	Construction, Maintenance and Repair	5,072	529	76	68
45	Transportation, Storage and Trade	9,566	834	1,285	393
46	Utilities	1,592	574	140	145
47	Communications and Other Services	17,240	1,047	392	535
48	Unallocated Sector	1,872	1,907	990	1,095
49	Total Intermediate Domestic Input (Rows 1 + ... + 48)	100,094	7,162	34,741	20,736
50	Imports	14,622	2,203	3,872	1,071
51	Wages and Salaries	54,191	6,096	5,492	7,712
52	Other Value Added	29,927	5,285	2,701	516
53	Total Value Added (Rows 51 + 52)	84,118	11,381	8,193	8,228
54	Total Input (Rows 49 + 50 + 53)	198,834	20,746	46,806	35,955

Food and Fiber Products	Grain Mills	Biscuits and Bakeries	Other Food Industries	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton, Wool and Synthetic Textile Mills	Other Primary Textile Mills	Other Textile Industries	Industry No.
5	6	7	8	9	10	11	12	13	14	
11,620	24,892	56	15,911	3,134	0	0	1	0	0	1
6	12	2	0	0	6	0	2	1	0	2
1,195	950	110	326	0	0	44	0	0	0	3
230	68	198	80	0	0	0	0	0	0	4
5,786	444	1,749	7,489	49	0	0	0	0	0	5
412	358	2,485	1,984	0	0	0	0	0	0	6
3	0	4	0	0	0	0	0	0	0	7
846	1,330	546	1,627	445	0	0	95	1	0	8
64	0	0	261	3,739	0	0	0	0	0	9
0	0	0	0	0	12,137	670	0	268	18	10
0	0	0	0	0	0	288	0	0	0	11
0	0	0	0	0	2,487	183	14,245	3,401	391	12
0	0	0	0	0	37	0	745	1,301	244	13
0	127	0	0	0	175	0	120	1,097	1,035	14
0	0	0	0	0	0	0	124	16	0	15
0	0	0	0	0	0	6	0	0	45	16
0	0	0	0	0	0	2	16	0	0	17
0	0	0	0	0	0	0	0	0	0	18
0	0	0	416	118	7	45	184	70	2	19
2,078	1,171	505	892	1,318	221	97	171	573	1,123	20
509	1	98	121	60	6	41	2	37	0	21
0	0	0	0	0	0	0	0	0	0	22
0	0	0	0	0	0	0	0	0	0	23
0	0	0	0	157	4	0	0	0	0	24
0	0	0	0	0	0	0	0	0	0	25
0	0	0	0	0	0	0	0	0	0	26
63	0	0	33	389	26	0	0	0	0	27
0	0	0	0	0	575	5	0	0	0	28
0	0	0	0	0	126	38	0	0	95	29
0	0	0	0	0	2,229	0	0	0	0	30
0	0	0	0	0	0	0	0	0	0	31
0	0	0	0	0	0	0	0	0	0	32
0	0	0	0	0	0	0	0	0	4	33
0	0	0	0	0	0	0	418	0	17	34
0	0	0	0	0	0	0	0	0	0	35
0	0	0	0	0	1	0	0	0	0	36
0	0	0	0	0	54	0	0	0	0	37
3,140	0	0	18	1,778	12	0	0	0	0	38
0	0	0	0	0	137	10	0	0	0	39
130	130	34	89	67	12,699	10	1,007	800	76	40
3	94	187	207	144	232	22	1	24	129	41
0	0	0	0	0	0	0	0	0	0	42
0	0	0	0	0	0	118	0	1	15	43
155	89	36	53	110	166	11	183	159	9	44
2,301	3,855	636	995	1,020	1,621	250	860	1,788	184	45
210	150	5	116	110	525	27	393	202	21	46
1,712	687	609	510	754	2,515	258	718	871	162	47
4,182	2,155	817	1,415	2,936	4,384	554	1,352	1,432	521	48
39,745	36,513	8,077	32,543	16,328	40,382	2,679	20,637	12,042	4,091	49
6,438	5,371	1,906	4,063	2,823	13,442	2,106	6,755	10,760	1,501	50
11,503	4,585	5,670	4,348	6,312	14,940	2,455	11,030	8,566	1,812	51
7,331	5,367	1,427	4,268	8,324	28,448	108	7,466	5,558	756	52
18,834	9,952	7,097	8,616	14,636	43,388	2,563	18,496	14,124	2,568	53
5017	51,836	17,080	45,222	33,787	97,212	7,348	45,888	36,926	8,160	54

Table I — The Inter-Industry Flow of Goods and Services, Niagara Region, 1967 — Continued
(Producers' Prices in Thousands of Dollars)

Industry No.	For the distribution of output of an industry, read the row for that industry. For the composition of inputs to an industry, read the column for that industry.	Knitting Mills	Clothing Industries	Wood Industries	Furniture Fixtures
		15	16	17	18
1	Agriculture, Forestry and Fishing	0	0	0	0
2	Mining	0	1	0	0
3	Meat and Poultry	0	0	0	0
4	Dairy Products	0	0	0	0
5	Fruit and Vegetable Products	0	0	0	0
6	Grain Mills	0	0	0	0
7	Biscuits and Bakeries	0	0	0	0
8	Other Food Industries	0	0	0	0
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	0	0	0	0
10	Rubber Products	0	0	0	0
11	Leather and Leather Products	0	2	0	0
12	Cotton, Wool and Synthetic Textile Mills	5,598	4,633	3	50
13	Other Primary Textile Mills	919	317	0	1
14	Other Textile Industries	177	94	0	0
15	Knitting Mills	517	0	0	0
16	Clothing Industries	0	0	0	0
17	Wood Industries	0	0	360	1,393
18	Furniture and Fixtures	0	0	352	86
19	Pulp and Paper Mills	10	92	584	23
20	Paper Products	242	138	13	55
21	Printing and Publishing	15	8	0	1
22	Iron and Steel Mills	0	0	1	336
23	Iron Foundries	0	0	0	0
24	Other Primary Metals Industries	0	0	8	0
25	Fabricated and Structural Metal	0	0	0	0
26	Ornamental and Architectural Metal	0	0	0	0
27	Metal Stamping, Pressing and Coating	0	0	38	0
28	Wire and Wire Products	0	0	32	111
29	Hardware, Tool and Cutlery	0	0	150	214
30	Other Metal Fabricating Industries	0	0	0	1,623
31	Miscellaneous Machinery	0	0	0	1,247
32	Motor Vehicle Parts and Accessories	0	0	0	0
33	Other Transportation Equipment	0	0	45	0
34	Electrical Appliances	0	0	0	0
35	Electrical Industrial Equipment	0	0	0	0
36	Communication and Other Electrical Equipment	0	0	0	0
37	Gypsum, Concrete, Stone and Clay Products	0	0	0	0
38	Other Non-metallic Mineral Products	0	0	323	49
39	Paint and Varnish	0	0	26	84
40	Industrial Chemicals, Soap and Toilet Products	334	0	23	3
41	Other Chemical Industries, Petroleum and Coal Products	1	170	0	83
42	Scientific and Professional Equipment	0	0	0	0
43	Miscellaneous Manufacturing Industries	37	168	113	0
44	Construction, Maintenance and Repair	32	14	42	18
45	Transportation, Storage and Trade	520	543	1,432	413
46	Utilities	87	48	94	20
47	Communications and Other Services	766	603	390	254
48	Unallocated Sector	748	632	529	316
49	Total Intermediate Domestic Input (Rows 1 + . . . + 48)	10,003	7,463	4,558	8,676
50	Imports	2,481	1,438	6,183	2,378
51	Wages and Salaries	5,906	5,875	4,710	3,374
52	Other Value Added	1,182	2,710	2,053	1,160
53	Total Value Added (Rows 51 + 52)	7,088	8,585	6,763	4,534
54	Total Input (Rows 49 + 50 + 53)	19,572	17,486	17,504	13,788

Pulp and Paper Mills	Paper Products	Printing and Publishing	Iron and Steel Mills	Iron Foundries	Other Primary Metals Industries	Fabricated and Structural Metal	Ornamental and Architec- tural Metal	Metal Stamping, Pressing and Coating	Wire and Wire Products	Industry No.
19	20	21	22	23	24	25	26	27	28	
0	0	0	0	0	0	0	0	0	0	1
90	19	0	1,536	313	6	3	0	2	3	2
0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	5
6	0	0	0	0	0	0	0	0	0	6
0	80	0	0	0	0	0	0	0	0	7
591	0	0	34	0	0	0	0	0	0	8
0	0	0	0	0	0	0	0	0	0	9
0	0	2	0	0	0	0	0	19	0	10
0	0	0	0	0	0	0	0	0	0	11
0	224	0	0	0	0	0	0	0	0	12
11	26	0	0	0	0	0	0	0	0	13
0	0	0	0	0	76	0	0	0	0	14
0	0	0	0	0	0	0	0	0	0	15
0	0	0	0	0	0	0	0	0	0	16
5	0	0	2,727	1	24	0	0	76	26	17
0	0	0	0	0	0	0	0	0	0	18
30,192	20,111	5,887	756	0	0	0	0	162	0	19
1,814	1,061	535	0	0	203	0	47	352	873	20
0	151	1,663	0	0	0	0	0	0	11	21
0	0	0	77,812	10,680	38,078	15,244	2,554	41,026	33,502	22
0	0	0	8,716	123	278	61	2	12	0	23
0	57	1	18,929	84	4,754	66	246	576	2,029	24
0	0	0	0	0	0	0	9	0	0	25
0	0	0	7	1	0	24	0	99	0	26
112	91	124	874	190	1,030	170	3,919	38	38	27
0	4	0	0	115	175	546	1,169	2,030	18,697	28
0	6	0	4	0	125	0	0	114	14	29
0	2	0	101	6,176	333	7,261	232	66	644	30
0	0	0	0	0	0	0	149	0	0	31
0	0	0	0	0	4,892	0	0	0	0	32
0	0	0	0	0	37	435	0	0	0	33
0	0	0	0	0	413	0	0	0	0	34
0	0	0	0	0	0	0	0	257	0	35
0	0	0	142	0	406	0	0	16	0	36
349	225	0	10,209	157	287	0	0	0	302	37
667	174	0	357	0	139	0	57	14	0	38
6	0	0	0	19	0	33	7	1,249	4	39
4,594	2,637	633	5,204	85	2,173	14	0	489	277	40
15	1,355	4	1,420	5	297	1	3	2	1	41
0	0	12	0	0	0	0	0	0	0	42
0	142	2	0	1	0	0	0	737	0	43
306	216	88	2,845	253	1,268	107	27	184	357	44
3,327	1,792	566	19,403	1,604	3,065	559	417	2,105	2,428	45
2,986	339	124	14,509	435	1,841	132	36	353	613	46
1,522	1,967	2,027	9,693	732	2,803	724	457	2,752	1,903	47
3,330	2,500	2,137	41,924	1,171	3,915	1,627	1,174	2,303	3,629	48
49,923	33,179	13,805	217,202	22,145	66,618	27,007	10,505	55,033	65,351	49
6,063	5,168	1,182	181,536	2,400	8,318	1,219	1,762	6,042	5,538	50
26,083	12,747	15,410	178,681	9,637	26,160	13,506	4,127	16,781	23,962	51
13,437	6,639	6,904	219,634	4,618	12,613	672	1,063	11,670	11,651	52
29,520	19,386	22,314	398,315	14,255	38,773	14,178	5,190	28,451	35,613	53
5,506	57,733	37,301	797,053	38,800	113,709	42,404	17,457	89,526	106,502	54

Table I – The Inter-Industry Flow of Goods and Services, Niagara Region, 1967 – Continued
(Producers' Prices in Thousands of Dollars)

Industry No.	Industry	Hardware, Tool and Cutlery	Other Metal Fabricating Industries	Miscel- laneous Machinery	Motor Vehicle Parts and Accessories
		29	30	31	32
1	Agriculture, Forestry and Fishing	0	0	0	0
2	Mining	1	105	39	462
3	Meat and Poultry	0	0	0	0
4	Dairy Products	0	0	0	0
5	Fruit and Vegetable Products	0	0	0	0
6	Grain Mills	0	0	0	0
7	Biscuits and Bakeries	0	0	0	0
8	Other Food Industries	0	0	0	0
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	0	0	0	0
10	Rubber Products	0	903	993	1,692
11	Leather and Leather Products	0	0	0	0
12	Cotton, Wool and Synthetic Textile Mills	0	0	0	1,751
13	Other Primary Textile Mills	0	0	0	0
14	Other Textile Industries	0	0	0	0
15	Knitting Mills	0	0	0	0
16	Clothing Industries	0	0	0	0
17	Wood Industries	83	154	172	159
18	Furniture and Fixtures	0	0	7	0
19	Pulp and Paper Mills	21	22	173	0
20	Paper Products	85	162	460	433
21	Printing and Publishing	0	0	18	0
22	Iron and Steel Mills	1,721	43,739	26,969	40,644
23	Iron Foundries	79	4,732	6,256	13,221
24	Other Primary Metals Industries	188	4,284	3,889	3,151
25	Fabricated and Structural Metal	0	15,783	0	0
26	Ornamental and Architectural Metal	1	17	0	0
27	Metal Stamping, Pressing and Coating	1,961	1,940	13,953	1,500
28	Wire and Wire Products	69	3,968	680	58
29	Hardware, Tool and Cutlery	106	508	242	3,518
30	Other Metal Fabricating Industries	247	6,432	34,830	1,923
31	Miscellaneous Machinery	68	5,631	2,522	0
32	Motor Vehicle Parts and Accessories	0	4,786	4,444	1,911
33	Other Transportation Equipment	0	373	0	70
34	Electrical Appliances	0	1	0	0
35	Electrical Industrial Equipment	656	2,158	938	0
36	Communication and Other Electrical Equipment	0	307	33	3
37	Gypsum, Concrete, Stone and Clay Products	44	41	0	776
38	Other Non-metallic Mineral Products	0	0	98	1,419
39	Paint and Varnish	31	303	718	148
40	Industrial Chemicals, Soap and Toilet Products	1	151	19	197
41	Other Chemical Industries, Petroleum and Coal Products	19	20	56	1,114
42	Scientific and Professional Equipment	0	15	13	0
43	Miscellaneous Manufacturing Industries	59	10	0	0
44	Construction, Maintenance and Repair	40	741	777	1,553
45	Transportation, Storage and Trade	482	5,192	8,330	8,751
46	Utilities	90	800	805	2,243
47	Communications and Other Services	743	7,050	6,947	3,752
48	Unallocated Sector	1,531	11,490	7,218	9,582
49	Total Intermediate Domestic Input (Rows 1 + ... + 48)	8,326	121,818	121,599	100,351
50	Imports	2,973	12,769	13,746	35,937
51	Wages and Salaries	6,464	63,740	49,735	73,244
52	Other Value Added	1,357	23,881	14,931	38,713
53	Total Value Added (Rows 51 + 52)	7,821	87,621	64,666	111,957
54	Total Input (Rows 49 + 50 + 53)	19,120	222,208	200,011	248,241

Power Trans- mission Equipment	Electrical Appliances	Electrical Industrial Equipment	Communi- cation and Other Electrical Equipment	Gypsum, Concrete, Stone and Clay Products	Other Non- metallic Mineral Products	Paint and Varnish	Industrial Chemicals, Soap and Toilet Products	Other Chemical Industries, Petroleum and Coal Products	Scientific and Professional Equipment	Industry No.
33	34	35	36	37	38	39	40	41	42	
3	0	3	0	1	0	0	11	1	0	1
4	1	1	4	2,001	24	11	630	851	0	2
0	0	0	0	0	0	0	1,092	0	0	3
0	0	0	0	202	0	0	5	0	0	4
0	0	0	0	0	0	0	6	0	0	5
0	0	0	0	0	0	0	4	0	0	6
0	0	0	0	0	0	0	0	0	0	7
0	0	0	0	112	0	203	10,714	170	0	8
0	0	0	0	0	0	0	0	0	0	9
573	82	0	430	0	0	9	124	0	4	10
0	0	0	0	0	0	0	69	0	2	11
5	35	41	38	0	167	0	0	0	3	12
1	0	0	0	0	0	0	0	0	1	13
2	0	0	28	0	2	0	0	0	0	14
0	0	0	0	0	0	0	0	0	1	15
0	0	0	0	0	0	0	0	0	0	16
27	0	67	41	84	51	0	1	33	1	17
0	0	0	0	0	0	0	0	0	12	18
3	4	2	1	2,516	134	0	5,326	0	24	19
15	1,281	298	179	674	1,027	23	7,535	1,732	10	20
0	0	0	2	0	20	0	8	53	0	21
10,414	10,343	7,316	51	393	279	0	16,319	5,048	48	22
833	0	840	103	0	217	0	0	0	2	23
685	621	536	1,003	3	4	0	816	0	50	24
42	0	0	0	0	0	0	0	0	9	25
0	0	0	0	0	0	0	0	0	0	26
65	22	70	49	44	54	397	3,670	22	62	27
42	3,048	4,632	348	507	44	0	0	0	4	28
59	0	38	0	1,811	0	0	0	0	1	29
4,845	0	3,204	458	72	64	0	44	0	31	30
3,367	1,206	0	0	0	0	0	0	0	2	31
1,112	0	218	0	0	0	0	0	0	0	32
15,290	0	0	806	0	0	0	0	110	0	33
51	361	0	0	0	0	0	0	0	0	34
3	7,839	91	969	0	0	0	0	0	4	35
129	187	0	10,427	0	102	0	6	0	407	36
1	62	0	41	907	5,325	0	353	0	0	37
63	13	373	1,026	853	9,836	25	990	195	55	38
217	868	45	7	11	0	268	220	79	2	39
25	370	24	641	432	1,076	2,560	35,174	22,139	16	40
43	93	23	30	31	1,144	265	8,385	2,455	14	41
23	43	6	0	0	0	0	0	0	16	42
2	0	7	0	4	0	0	459	0	7	43
366	116	179	78	302	382	21	1,262	323	6	44
2,666	1,824	2,062	927	3,160	2,080	301	7,576	1,532	47	45
324	179	469	80	452	4,549	28	6,795	355	5	46
1,915	2,145	3,141	1,894	2,003	2,472	432	7,523	839	93	47
2,073	3,337	4,062	1,548	4,048	5,403	855	17,329	2,075	189	48
45,288	34,080	27,748	21,209	20,623	34,456	5,398	132,446	38,012	1,128	49
5,655	8,113	6,942	3,351	10,996	9,460	905	19,787	8,935	338	50
22,090	13,240	28,939	10,777	13,620	24,230	1,811	29,150	4,594	806	51
8,276	6,018	24,236	5,630	10,296	8,259	1,684	47,455	511	127	52
20,366	19,258	53,175	16,407	23,916	32,489	3,495	76,605	5,105	933	53
22,309	61,451	87,865	40,967	55,535	76,405	9,798	228,838	52,052	2,399	54

Table I — The Inter-Industry Flow of Goods and Services, Niagara Region, 1967 — Continued
(Producers' Prices in Thousands of Dollars)

Industry No.	Industry	Miscellaneous Manufacturing Industries 43	Construction, Maintenance and Repair 44	Transportation, Storage and Trade 45	Utilities 46
	<i>For the distribution of output of an industry, read the row for that industry.</i>				
	<i>For the composition of inputs to an industry, read the column for that industry.</i>				
1	Agriculture, Forestry and Fishing	17	669	12,695	0
2	Mining	508	3,763	45	14
3	Meat and Poultry	3	0	116	0
4	Dairy Products	0	0	257	0
5	Fruit and Vegetable Products	0	0	0	0
6	Grain Mills	0	0	290	0
7	Biscuits and Bakeries	0	0	0	0
8	Other Food Industries	4	0	33	0
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	0	0	0	0
10	Rubber Products	1,118	1,414	1,543	0
11	Leather and Leather Products	27	6	7	0
12	Cotton, Wool and Synthetic Textile Mills	95	51	748	0
13	Other Primary Textile Mills	43	612	472	0
14	Other Textile Industries	3	314	301	0
15	Knitting Mills	25	0	0	0
16	Clothing Industries	8	0	241	0
17	Wood Industries	84	6,801	43	0
18	Furniture and Fixtures	3	345	10	0
19	Pulp and Paper Mills	193	1,447	1,065	0
20	Paper Products	584	2,413	3,814	0
21	Printing and Publishing	50	0	346	22
22	Iron and Steel Mills	999	6,234	283	0
23	Iron Foundries	26	3,126	17	0
24	Other Primary Metals Industries	1,037	7,353	68	0
25	Fabricated and Structural Metal	0	10,089	16	0
26	Ornamental and Architectural Metal	0	5,441	0	0
27	Metal Stamping, Pressing and Coating	356	4,884	498	0
28	Wire and Wire Products	276	2,942	156	0
29	Hardware, Tool and Cutlery	79	1,548	36	0
30	Other Metal Fabricating Industries	125	21,238	801	0
31	Miscellaneous Machinery	18	850	332	126
32	Motor Vehicle Parts and Accessories	8	476	1,421	0
33	Other Transportation Equipment	5	0	1,916	0
34	Electrical Appliances	36	500	0	0
35	Electrical Industrial Equipment	35	2,490	6	0
36	Communication and Other Electrical Equipment	16	2,762	227	0
37	Gypsum, Concrete, Stone and Clay Products	45	18,658	26	0
38	Other Non-metallic Mineral Products	105	2,323	47	0
39	Paint and Varnish	36	1,182	6	0
40	Industrial Chemicals, Soap and Toilet Products	223	879	220	33
41	Other Chemical Industries, Petroleum and Coal Products	1,736	396	303	10
42	Scientific and Professional Equipment	0	46	6	0
43	Miscellaneous Manufacturing Industries	1,349	1,134	396	0
44	Construction, Maintenance and Repair	91	206	9,826	5,209
45	Transportation, Storage and Trade	757	31,757	26,026	1,077
46	Utilities	161	225	4,523	23,681
47	Communications and Other Services	1,622	20,896	51,608	6,221
48	Unallocated Sector	3,578	2,797	43,007	2,256
49	Total Intermediate Domestic Input (Rows 1 + . . . + 48)	15,484	168,267	163,797	38,649
50	Imports	5,075	66,417	45,746	2,791
51	Wages and Salaries	12,017	165,486	289,773	35,796
52	Other Value Added	2,753	50,425	182,220	57,693
53	Total Value Added (Rows 51 + 52)	14,770	215,911	471,993	93,489
54	Total Input (Rows 49 + 50 + 53)	35,329	450,595	681,536	134,929

Communications and Other Services	Unallocated Sector	Total Intermediate Demand (Columns 1 + ... + 48)	Personal Consumption Expenditures	Investment	Changes in Inventories	Government Expenditures	Exports	Total Final Demand (Columns 50 + ... + 54)	Total Output (Columns 49 + 55)	Industry No.
47	48	49	50	51	52	53	54	55	56	
4,205	1,064	135,876	28,462	0	1,500	357	32,639	62,958	198,834	1
15	0	10,525	0	0	37	1,093	9,091	10,221	20,746	2
5,489	1,083	13,072	33,777	0	— 127	84	0	33,734	46,806	3
7,419	1,213	10,689	19,247	0	— 39	138	0	19,346	30,035	4
3,338	606	20,350	37,097	0	— 735	49	8,256	44,667	65,017	5
711	113	35,056	16,450	0	220	110	0	16,780	51,836	6
3,021	475	3,584	13,416	0	32	48	0	13,496	17,080	7
1,454	340	19,070	23,776	0	107	65	2,204	26,152	45,222	8
967	513	5,544	14,710	0	— 901	27	14,407	28,243	33,787	9
142	7,038	30,461	738	81	440	95	65,397	66,751	97,212	10
111	331	843	6,020	0	42	7	436	6,505	7,348	11
1,539	65	35,756	6,159	0	400	24	3,549	10,132	45,888	12
232	16	5,936	4,890	176	1,020	24	24,880	30,990	36,926	13
674	872	5,107	1,892	231	— 46	118	858	3,053	8,160	14
0	0	683	9,402	0	— 1,260	3	10,744	18,889	19,572	15
23	87	410	16,913	0	130	33	0	17,076	17,486	16
980	1	13,878	273	18	— 30	120	3,245	3,626	17,504	17
27	0	842	10,167	4,517	32	30	0	14,746	15,588	18
772	863	71,235	5,681	0	1,173	33	17,384	24,271	95,506	19
801	4,468	40,929	3,430	0	1,134	142	12,098	16,804	57,733	20
580	28,968	32,888	3,497	0	— 62	616	362	4,413	37,301	21
11	168	390,213	0	0	— 3,370	134	410,076	406,840	797,053	22
0	18	38,662	0	0	— 361	499	0	138	38,800	23
127	347	51,073	726	0	1,880	210	59,820	62,636	113,709	24
0	0	25,948	0	0	— 3,275	1,995	17,736	16,456	42,404	25
0	0	6,057	436	845	146	286	9,687	11,400	17,457	26
0	0	44,880	834	383	— 135	283	43,281	44,646	89,526	27
220	6,401	47,430	487	158	2,963	242	55,222	59,072	106,502	28
16	3,429	12,297	6,139	914	— 404	174	0	6,823	19,120	29
19	21,668	116,612	3,205	73,101	— 3,764	1,714	31,340	105,596	222,208	30
654	738	19,855	1,937	24,223	— 1,502	137	155,361	180,156	200,011	31
0	8,485	28,247	27,683	6,820	— 3,482	276	188,701	219,998	248,245	32
0	115	19,268	17,143	19,940	— 4,046	60	28,944	62,041	81,309	33
0	178	1,975	12,656	825	648	7	45,340	59,476	61,451	34
0	1,559	17,005	1,129	13,380	2,038	69	54,244	70,860	87,865	35
57	1,956	17,254	7,774	12,131	— 137	138	3,807	23,713	40,967	36
117	27	38,092	1,200	0	300	1,490	14,453	17,443	55,535	37
180	1,256	25,679	3,500	0	449	61	46,716	50,726	76,405	38
565	2,371	8,652	969	0	79	98	0	1,146	9,798	39
2,828	8,029	108,229	10,866	0	2,432	401	106,910	120,609	228,838	40
452	379	30,106	5,883	0	360	557	15,146	21,946	52,052	41
191	363	734	347	1,225	19	74	0	1,665	2,399	42
744	5,062	10,586	16,528	2,157	219	291	5,548	24,743	35,329	43
52,783	0	86,734	0	363,861	0	0	0	363,861	450,595	44
9,836	60,548	238,693	326,718	102,948	2,597	10,580	0	442,843	681,536	45
2,931	0	74,522	30,797	0	119	2,073	27,418	60,407	134,929	46
110,458	75,369	361,726	606,212	16,869	651	42,063	109,866	775,661	1,137,387	47
46,347	0	260,272	45,874	0	906	11,631	1,642	60,053	320,325	48
261,036	246,582	2,573,535	0	0	— 0	0	0	0	0	49
36,721	73,743	679,041	565,960	565,960	113	15,201	0	684,550	1,363,591	50
260,905	0	1,598,088	0	0	0	253,147	0	253,147	1,851,235	51
578,725	0	1,466,678	0	0	0	0	0	0	1,466,678	52
839,630	0	3,064,766	0	0	0	253,147	0	253,147	3,317,913	53
1,137,387	320,325	6,317,342	1,951,000	748,305	— 1,716	347,107	1,636,808	4,681,504	0	54

Table II — Direct Requirements Table, Niagara Region, 1967
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Fruit and Vegetable Products	Grain Mills
	Industry	1	2	3	4	5	6
1	Agriculture, Forestry and Fishing	.091941	.0	.572042	.550591	.178722	.480207
2	Mining	.0	.001928	.000064	.000033	.000092	.000231
3	Meat and Poultry	.0	.0	.056916	.0	.018380	.018327
4	Dairy Products	.0	.0	.0	.033860	.003538	.001312
5	Fruit and Vegetable Products	.0	.0	.017305	.002430	.088992	.008565
6	Grain Mills	.144186	.0	.000513	.0	.006337	.006906
7	Biscuits and Bakeries	.0	.0	.0	.000033	.000046	.0
8	Other Food Industries	.001710	.0	.002820	.001765	.013012	.025658
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.0	.0	.0	.0	.000984	.0
10	Rubber Products	.006448	.0	.0	.0	.0	.0
11	Leather and Leather Products	.0	.0	.0	.0	.0	.0
12	Cotton, Wool and Synthetic Textile Mills	.000015	.0	.0	.0	.0	.0
13	Other Primary Textile Mills	.004818	.0	.0	.0	.0	.0
14	Other Textile Industries	.000050	.0	.0	.0	.0	.002450
15	Knitting Mills	.0	.0	.0	.0	.0	.0
16	Clothing Industries	.0	.0	.0	.0	.0	.0
17	Wood Industries	.002339	.0	.000021	.0	.0	.0
18	Furniture and Fixtures	.0	.0	.0	.0	.0	.0
19	Pulp and Paper Mills	.0	.0	.000214	.0	.0	.0
20	Paper Products	.000734	.0	.012947	.023339	.031961	.022590
21	Printing and Publishing	.0	.0	.002072	.0	.007829	.000019
22	Iron and Steel Mills	.0	.000048	.0	.0	.0	.0
23	Iron Foundries	.0	.0	.0	.0	.0	.0
24	Other Primary Metals Industries	.0	.0	.0	.0	.0	.0
25	Fabricated and Structural Metal	.0	.0	.0	.0	.0	.0
26	Ornamental and Architectural Metal	.002349	.0	.0	.0	.0	.0
27	Metal Stamping, Pressing and Coating	.000005	.000048	.010084	.000266	.079410	.0
28	Wire and Wire Products	.002897	.0	.0	.0	.0	.0
29	Hardware, Tool and Cutlery	.000101	.0	.0	.0	.0	.0
30	Other Metal Fabricating Industries	.001987	.074665	.0	.0	.0	.0
31	Miscellaneous Machinery	.014806	.000048	.0	.0	.0	.0
32	Motor Vehicle Parts and Accessories	.0	.023812	.0	.0	.0	.0
33	Other Transportation Equipment	.000312	.0	.0	.0	.0	.0
34	Electrical Appliances	.0	.0	.0	.0	.0	.0
35	Electrical Industrial Equipment	.0	.0	.0	.0	.0	.0
36	Communication and Other Electrical Equipment	.000352	.0	.0	.0	.0	.0
37	Gypsum, Concrete, Stone and Clay Products	.0	.004145	.0	.0	.0	.0
38	Other Non-metallic Mineral Products	.0	.0	.0	.003130	.048295	.0
39	Paint and Varnish	.0	.0	.0	.0	.0	.0
40	Industrial Chemicals, Soap and Toilet Products	.008369	.000145	.000192	.000266	.001999	.002508
41	Other Chemical Industries, Petroleum and Coal Products	.042146	.004627	.005448	.000233	.000046	.001813
42	Scientific and Professional Equipment	.0	.0	.0	.0	.0	.0
43	Miscellaneous Manufacturing Industries	.000096	.0	.0	.0	.0	.0
44	Construction, Maintenance and Repair	.025509	.025499	.001624	.002264	.002384	.001717
45	Transportation, Storage and Trade	.048110	.040201	.027454	.013085	.035391	.074369
46	Utilities	.008007	.027668	.002991	.004828	.003230	.002894
47	Communications and Other Services	.086705	.050468	.008375	.017813	.026332	.013253
48	Unallocated Sector	.009415	.091921	.021151	.036457	.064322	.041573
49	Imports	.073539	.106189	.082724	.035658	.099020	.103615
50	Wages and Salaries	.272544	.293840	.117335	.256767	.176923	.088452
51	Other Value Added	.150512	.254748	.057706	.017180	.112755	.103538
52	Total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Note: Figures may not add to total due to rounding.

Biscuits and Bakeries	Other Food Industries	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton, Wool and Synthetic Textile Mills	Other Primary Textile Mills	Other Textile Industries	Knitting Mills	Clothing Industries	Industry No.
7	8	9	10	11	12	13	14	15	16	
.003279	.351842	.092758	.0	.0	.000022	.0	.0	.0	.0	1
.000117	.0	.0	.000062	.0	.000044	.000027	.0	.0	.000057	2
.006440	.007209	.0	.0	.005988	.0	.0	.0	.0	.0	3
.011593	.001769	.0	.0	.0	.0	.0	.0	.0	.0	4
.102400	.165605	.001450	.0	.0	.0	.0	.0	.0	.0	5
.145492	.043872	.0	.0	.0	.0	.0	.0	.0	.0	6
.000234	.0	.0	.0	.0	.0	.0	.0	.0	.0	7
.031967	.035978	.013171	.0	.0	.002070	.000027	.0	.0	.0	8
.0	.005772	.110664	.0	.0	.0	.0	.0	.0	.0	9
.0	.0	.0	.124851	.091181	.0	.007258	.002206	.0	.0	10
.0	.0	.0	.0	.039194	.0	.0	.0	.0	.000114	11
.0	.0	.0	.025583	.024905	.310430	.092103	.047917	.286021	.264955	12
.0	.0	.0	.000381	.0	.016235	.035233	.029902	.046955	.018129	13
.0	.0	.0	.001800	.0	.002615	.029708	.126838	.009044	.005376	14
.0	.0	.0	.0	.0	.002702	.000433	.0	.026415	.0	15
.0	.0	.0	.0	.000817	.0	.0	.005515	.0	.0	16
.0	.0	.0	.0	.000272	.000349	.0	.0	.0	.0	17
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	18
.0	.009199	.003492	.000072	.006124	.004010	.001896	.000245	.000511	.005261	19
.029567	.019725	.039009	.002273	.013201	.003726	.015518	.137623	.012365	.007892	20
.005738	.002676	.001776	.000062	.005580	.000044	.001002	.0	.000766	.000458	21
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	22
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	23
.0	.0	.004647	.000041	.0	.0	.0	.0	.0	.0	24
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	25
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	26
.0	.000730	.011513	.000267	.0	.0	.0	.0	.0	.0	27
.0	.0	.0	.005915	.000680	.0	.0	.0	.0	.0	28
.0	.0	.0	.001296	.005171	.0	.0	.011642	.0	.0	29
.0	.0	.0	.022929	.0	.0	.0	.0	.0	.0	30
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	31
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	32
.0	.0	.0	.0	.0	.0	.0	.000490	.0	.0	33
.0	.0	.0	.0	.0	.009109	.0	.002083	.0	.0	34
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	35
.0	.0	.0	.000010	.0	.0	.0	.0	.0	.0	36
.0	.0	.0	.000555	.0	.0	.0	.0	.0	.0	37
.0	.000398	.052624	.000123	.0	.0	.0	.0	.0	.0	38
.0	.0	.0	.001409	.001361	.0	.0	.0	.0	.0	39
.001991	.001968	.001983	.130632	.001361	.021945	.021665	.009314	.017065	.0	40
.010948	.004577	.004262	.002387	.002994	.000022	.000650	.015809	.000051	.009722	41
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	42
.0	.0	.0	.0	.016059	.0	.000027	.001838	.001890	.009608	43
.002108	.001172	.003256	.001708	.001497	.003988	.004306	.001103	.001635	.000801	44
.037237	.022003	.030189	.016675	.034023	.018741	.048421	.022549	.026569	.031053	45
.000293	.002565	.003256	.005401	.003674	.008564	.005470	.002574	.004445	.002745	46
.035656	.011278	.022316	.025871	.035112	.015647	.023588	.019853	.039138	.034485	47
.047834	.031290	.086897	.045097	.075395	.029463	.038780	.063848	.038218	.036143	48
.111593	.089846	.083553	.138275	.286609	.147206	.291394	.183946	.126763	.082237	49
.331967	.096148	.186817	.153685	.334105	.240368	.231977	.222059	.301758	.335983	50
.083548	.094379	.246367	.292639	.014698	.162700	.150517	.092647	.060392	.154981	51
1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	52

Table II — Direct Requirements Table, Niagara Region, 1967 — Continued
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Wood Industries	Furniture and Fixtures	Pulp and Paper Mills	Paper Products	Printing and Publishing	Iron and Steel Mills
		17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	.0	.0	.0	.0	.0	.0
2	Mining	.0	.0	.000942	.000329	.0	.001927
3	Meat and Poultry	.0	.0	.0	.0	.0	.0
4	Dairy Products	.0	.0	.0	.0	.0	.0
5	Fruit and Vegetable Products	.0	.0	.0	.0	.0	.0
6	Grain Mills	.0	.0	.000063	.0	.0	.0
7	Biscuits and Bakeries	.0	.0	.0	.001386	.0	.0
8	Other Food Industries	.0	.0	.006188	.0	.0	.000043
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.0	.0	.0	.0	.0	.0
10	Rubber Products	.0	.0	.0	.0	.000054	.0
11	Leather and Leather Products	.0	.0	.0	.0	.0	.0
12	Cotton, Wool and Synthetic Textile Mills	.000171	.003208	.0	.003880	.0	.0
13	Other Primary Textile Mills	.0	.000064	.000115	.000450	.0	.0
14	Other Textile Industries	.0	.0	.0	.0	.0	.0
15	Knitting Mills	.0	.0	.0	.0	.0	.0
16	Clothing Industries	.0	.0	.0	.0	.0	.0
17	Wood Industries	.020567	.089364	.000052	.0	.0	.003421
18	Furniture and Fixtures	.020110	.005517	.0	.0	.0	.0
19	Pulp and Paper Mills	.033364	.001475	.316127	.348345	.157824	.000948
20	Paper Products	.000743	.003528	.018994	.018378	.014343	.0
21	Printing and Publishing	.0	.000064	.0	.002615	.044583	.0
22	Iron and Steel Mills	.000057	.021555	.0	.0	.0	.097625
23	Iron Foundries	.0	.0	.0	.0	.0	.010935
24	Other Primary Metals Industries	.000457	.0	.0	.000987	.000027	.023749
25	Fabricated and Structural Metal	.0	.0	.0	.0	.0	.0
26	Ornamental and Architectural Metal	.0	.0	.0	.0	.0	.0
27	Metal Stamping, Pressing and Coating	.002171	.147293	.001173	.001576	.003324	.001097
28	Wire and Wire Products	.001828	.007121	.0	.000069	.0	.0
29	Hardware, Tool and Cutlery	.008569	.013729	.0	.000104	.0	.000005
30	Other Metal Fabricating Industries	.0	.104119	.0	.000035	.0	.000127
31	Miscellaneous Machinery	.0	.079997	.0	.0	.0	.0
32	Motor Vehicle Parts and Accessories	.0	.0	.0	.0	.0	.0
33	Other Transportation Equipment	.002571	.0	.0	.0	.0	.0
34	Electrical Appliances	.0	.0	.0	.0	.0	.0
35	Electrical Industrial Equipment	.0	.0	.0	.0	.0	.0
36	Communication and Other Electrical Equipment	.0	.0	.0	.0	.0	.000178
37	Gypsum, Concrete, Stone and Clay Products	.0	.0	.003654	.003897	.0	.012808
38	Other Non-metallic Mineral Products	.018453	.003143	.006984	.003014	.0	.000448
39	Paint and Varnish	.001485	.005389	.000063	.0	.0	.0
40	Industrial Chemicals, Soap and Toilet Products	.001314	.000192	.048102	.045676	.016970	.006529
41	Other Chemical Industries, Petroleum and Coal Products	.0	.005325	.000157	.023470	.000107	.001782
42	Scientific and Professional Equipment	.0	.0	.0	.0	.000322	.0
43	Miscellaneous Manufacturing Industries	.006456	.0	.0	.002460	.000054	.0
44	Construction, Maintenance and Repair	.002399	.001155	.003204	.003741	.002359	.003569
45	Transportation, Storage and Trade	.081810	.026495	.034836	.031039	.015174	.024343
46	Utilities	.005370	.001283	.031265	.005872	.003324	.018203
47	Communications and Other Services	.022281	.016295	.015936	.034071	.054342	.012161
48	Unallocated Sector	.030222	.020272	.034867	.043303	.057291	.052599
49	Imports	.353234	.152553	.063483	.089516	.031688	.227759
50	Wages and Salaries	.269081	.216449	.273103	.220792	.413126	.224177
51	Other Value Added	.117287	.074416	.140693	.114995	.185089	.275558
52	Total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Note: Figures may not add to total due to rounding.

[illegible]

Table II – Direct Requirements Table, Niagara Region, 1967 – Continued
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Other Trans- portation Equipment	Electrical Appliances	Electrical Industrial Equipment	Communi- cation and Other Electrical Equipment	Gypsum, Concrete, Stone and Clay Products	Other Non- metallic Mineral Products
		33	34	35	36	37	38
1	Agriculture, Forestry and Fishing	.000037	.0	.000034	.0	.000018	.0
2	Mining	.000049	.000016	.000011	.000098	.036031	.000314
3	Meat and Poultry	.0	.0	.0	.0	.0	.0
4	Dairy Products	.0	.0	.0	.0	.003637	.0
5	Fruit and Vegetable Products	.0	.0	.0	.0	.0	.0
6	Grain Mills	.0	.0	.0	.0	.0	.0
7	Biscuits and Bakeries	.0	.0	.0	.0	.0	.0
8	Other Food Industries	.0	.0	.0	.0	.002017	.0
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.0	.0	.0	.0	.0	.0
10	Rubber Products	.007047	.001334	.0	.010496	.0	.0
11	Leather and Leather Products	.0	.0	.0	.0	.0	.0
12	Cotton, Wool and Synthetic Textile Mills	.000061	.000570	.000467	.000928	.0	.002186
13	Other Primary Textile Mills	.000012	.0	.0	.0	.0	.0
14	Other Textile Industries	.000025	.0	.0	.000683	.0	.000026
15	Knitting Mills	.0	.0	.0	.0	.0	.0
16	Clothing Industries	.0	.0	.0	.0	.0	.0
17	Wood Industries	.000332	.0	.000763	.001001	.001513	.000667
18	Furniture and Fixtures	.0	.0	.0	.0	.0	.0
19	Pulp and Paper Mills	.000037	.000065	.000023	.000024	.045305	.001754
20	Paper Products	.000184	.020846	.003392	.004369	.012136	.013442
21	Printing and Publishing	.0	.0	.0	.000049	.0	.000262
22	Iron and Steel Mills	.128079	.168313	.083264	.001245	.007077	.003652
23	Iron Foundries	.010245	.0	.009560	.002514	.0	.002840
24	Other Primary Metals Industries	.008425	.010106	.006100	.024483	.000054	.000052
25	Fabricated and Structural Metal	.000517	.0	.0	.0	.0	.0
26	Ornamental and Architectural Metal	.0	.0	.0	.0	.0	.0
27	Metal Stamping, Pressing and Coating	.000799	.000358	.000797	.001196	.000792	.000707
28	Wire and Wire Products	.000517	.049600	.052717	.008495	.009129	.000576
29	Hardware, Tool and Cutlery	.000726	.0	.000432	.0	.032610	.0
30	Other Metal Fabricating Industries	.059587	.0	.036465	.011180	.001296	.000838
31	Miscellaneous Machinery	.041410	.019625	.0	.0	.0	.0
32	Motor Vehicle Parts and Accessories	.013676	.0	.002481	.0	.0	.0
33	Other Transportation Equipment	.188048	.0	.0	.019674	.0	.0
34	Electrical Appliances	.000627	.005875	.0	.0	.0	.0
35	Electrical Industrial Equipment	.000037	.127565	.001036	.023653	.0	.0
36	Communication and Other Electrical Equipment	.001587	.003043	.0	.254522	.0	.001335
37	Gypsum, Concrete, Stone and Clay Products	.000012	.001009	.0	.001001	.016332	.069694
38	Other Non-metallic Mineral Products	.000775	.000212	.004245	.025045	.015360	.128735
39	Paint and Varnish	.002669	.014125	.000512	.000171	.000198	.0
40	Industrial Chemicals, Soap and Toilet Products	.000307	.006021	.000273	.015647	.007779	.014083
41	Other Chemical Industries, Petroleum and Coal Products	.000529	.001513	.000262	.000732	.000558	.014973
42	Scientific and Professional Equipment	.000283	.000700	.000068	.0	.0	.0
43	Miscellaneous Manufacturing Industries	.000025	.0	.000080	.0	.000072	.0
44	Construction, Maintenance and Repair	.004501	.001888	.002037	.001904	.005438	.005000
45	Transportation, Storage and Trade	.032788	.029682	.023468	.022628	.056901	.027223
46	Utilities	.003985	.002913	.005338	.001953	.008139	.059538
47	Communications and Other Services	.023552	.034906	.035748	.046232	.036067	.032354
48	Unallocated Sector	.025495	.054303	.046230	.037787	.072891	.070715
49	Imports	.069549	.132024	.079008	.081798	.198001	.123814
50	Wages and Salaries	.271680	.215456	.329358	.263065	.245251	.317126
51	Other Value Added	.101785	.097932	.275832	.137428	.185397	.108095
52	Total	1.000000	1.000000	1.000000	1.000000	0.000000	1.000000

Note: Figures may not add to total due to rounding.

Table III – Total Requirements Table, Niagara Region, 1967
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Agriculture, Forestry, and Fishing	Mining	Meat and Poultry	Dairy Products	Fruit and Vegetable Products	Grain Mills
	Industry	1	2	3	4	5	6
1	Agriculture, Forestry and Fishing	1.205444	.004900	.739859	.690472	.270382	.616965
2	Mining	.001638	1.002837	.001318	.001135	.001093	.001301
3	Meat and Poultry	.004740	.001049	1.064003	.003193	.023650	.023020
4	Dairy Products	.001496	.001214	.001316	1.036368	.005367	.002791
5	Fruit and Vegetable Products	.004131	.000821	.023578	.005824	1.102613	.017337
6	Grain Mills	.175694	.000962	.108756	.100853	.047357	1.098339
7	Biscuits and Bakeries	.000474	.000450	.000428	.000510	.000564	.000477
8	Other Food Industries	.009690	.000913	.009880	.007983	.018568	.032819
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.000288	.000312	.000306	.000302	.001639	.000488
10	Rubber Products	.010751	.004035	.007578	.007460	.005319	.007313
11	Leather and Leather Products	.000080	.000140	.000089	.000101	.000138	.000111
12	Cotton, Wool and Synthetic Textile Mills	.001929	.000946	.001486	.001498	.001393	.001764
13	Other Primary Textile Mills	.006261	.000195	.003905	.003651	.001549	.003420
14	Other Textile Industries	.001126	.000519	.000838	.000836	.000694	.003679
15	Knitting Mills	.000009	.000004	.000007	.000007	.000007	.000008
16	Clothing Industries	.000055	.000063	.000058	.000055	.000069	.000095
17	Wood Industries	.003828	.000891	.002520	.002334	.001420	.002131
18	Furniture and Fixtures	.000115	.000049	.000079	.000074	.000048	.000070
19	Pulp and Paper Mills	.009618	.006243	.016534	.020571	.030033	.021536
20	Paper Products	.011141	.003723	.023251	.032763	.044207	.033109
21	Printing and Publishing	.004489	.010978	.008308	.006987	.019588	.008092
22	Iron and Steel Mills	.023824	.037203	.024329	.016962	.059080	.017341
23	Iron Foundries	.001567	.004308	.001234	.001156	.001593	.001137
24	Other Primary Metals Industries	.002533	.004259	.002176	.001909	.003361	.001812
25	Fabricated and Structural Metal	.001796	.007151	.001385	.001405	.001193	.001112
26	Ornamental and Architectural Metal	.003335	.000437	.002110	.001973	.000958	.001779
27	Metal Stamping, Pressing and Coating	.004157	.002524	.015331	.003353	.089874	.004173
28	Wire and Wire Products	.006659	.005588	.005368	.005146	.006879	.005115
29	Hardware, Tool and Cutlery	.000984	.002236	.001024	.001134	.001707	.001249
30	Other Metal Fabricating Industries	.012252	.089908	.010203	.010706	.010960	.010996
31	Miscellaneous Machinery	.018811	.002942	.011747	.011037	.004796	.009992
32	Motor Vehicle Parts and Accessories	.002274	.029532	.002425	.002679	.003614	.003038
33	Other Transportation Equipment	.001055	.000658	.000838	.000744	.000600	.000936
34	Electrical Appliances	.000102	.000130	.000091	.000096	.000110	.000108
35	Electrical Industrial Equipment	.000744	.001773	.000723	.000750	.001123	.000791
36	Communication and Other Electrical Equipment	.001394	.001502	.001194	.001257	.001432	.001306
37	Gypsum, Concrete, Stone and Clay Products	.002388	.006485	.002013	.002134	.006405	.001861
38	Other Non-metallic Mineral Products	.001554	.001373	.002556	.005346	.062748	.002335
39	Paint and Varnish	.000839	.001256	.000990	.000892	.002325	.000963
40	Industrial Chemicals, Soap and Toilet Products	.046399	.009671	.035439	.031936	.025542	.033660
41	Other Chemical Industries, Petroleum and Coal Products	.056245	.006256	.041470	.033588	.016048	.032343
42	Scientific and Professional Equipment	.000084	.000163	.000095	.000109	.000152	.000119
43	Miscellaneous Manufacturing Industries	.001305	.002161	.001540	.001635	.002929	.001821
44	Construction, Maintenance and Repair	.041140	.034041	.029311	.028641	.018361	.026819
45	Transportation, Storage and Trade	.095319	.075458	.098883	.080866	.094267	.143432
46	Utilities	.017479	.037412	.016416	.017911	.017731	.015233
47	Communications and Other Services	.147903	.103586	.115907	.122342	.109894	.117831
48	Unallocated Sector	.044087	.114505	.058500	.070319	.107407	.079281
49	Total	1.989226	1.623762	2.497392	2.379005	2.226788	2.391821

Note: Figures may not add to total due to rounding.

Biscuits and Bakeries	Other Food Industries	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton, Wool and Synthetic Textile Mills	Other Primary Textile Mills	Other Textile Industries	Knitting Mills	Clothing Industries	Industry No.
7	8	9	10	11	12	13	14	15	16	
.154381	.524211	.138663	.008596	.009575	.005402	.004632	.005692	.005102	.004291	1
.000895	.001107	.000859	.001095	.000677	.000426	.000409	.000980	.000409	.000654	2
.013833	.015193	.001735	.001799	.007662	.000798	.000796	.001111	.000970	.000778	3
.013816	.003897	.001269	.000883	.001027	.000617	.000688	.000987	.000885	.000777	4
.122432	.192295	.005929	.002290	.001101	.001365	.000857	.001221	.001095	.000852	5
.171773	.123789	.021184	.001848	.001679	.001152	.000929	.001201	.001053	.000873	6
1.000694	.000471	.000507	.000335	.000407	.000237	.000285	.000595	.000357	.000307	7
.041449	1.046562	.018060	.009820	.002201	.005630	.002631	.003578	.003335	.002342	8
.000655	.007254	1.124875	.000285	.000283	.000191	.000186	.000289	.000230	.000199	9
.003815	.006488	.004734	1.145408	.112175	.002030	.010690	.006442	.002760	.002550	10
.000114	.000111	.000156	.000158	1.040939	.000083	.000087	.000143	.000101	.000211	11
.001049	.001404	.001295	.043333	.042883	1.455976	.142729	.088830	.435880	.389270	12
.000957	.002825	.000874	.001399	.000983	.024969	1.040214	.037396	.057951	.025778	13
.000932	.000885	.000630	.002889	.000831	.005509	.036135	1.147287	.014255	.008504	14
.000005	.000007	.000006	.000122	.000134	.004053	.000860	.000267	1.028370	.001100	15
.000063	.000063	.000069	.000058	.000913	.000064	.000244	.006382	.000122	1.000089	16
.000790	.001890	.000838	.000430	.000681	.000802	.000328	.000429	.000456	.000418	17
.000031	.000061	.000033	.000019	.000025	.000027	.000017	.000019	.000020	.000018	18
.028495	.038016	.038201	.016093	.025212	.017451	.020506	.092220	.018271	.020507	19
.044224	.036732	.051954	.012658	.019292	.010547	.025732	.168862	.021344	.014621	20
.015617	.012390	.014447	.008074	.016102	.005679	.007143	.010696	.007764	.006670	21
.015851	.024136	.021210	.034411	.012325	.010895	.008138	.016298	.009079	.008296	22
.000748	.001151	.001148	.001448	.000709	.000464	.000432	.000750	.000468	.000423	23
.1416	.002104	.007241	.003046	.001835	.001133	.000934	.001766	.001078	.001145	24
.00900	.001264	.001134	.002659	.000979	.000601	.000625	.000835	.000646	.000559	25
.000543	.001537	.000522	.000137	.000126	.000141	.000135	.000124	.000131	.000106	26
.011334	.018637	.015125	.004719	.002223	.001352	.001300	.003320	.001344	.001034	27
.003509	.005131	.004742	.011459	.004984	.002696	.002063	.003525	.002429	.002237	28
.001172	.001237	.001791	.002670	.006882	.000812	.001229	.014791	.001063	.000916	29
.008273	.010327	.011286	.034617	.011171	.005159	.005594	.008993	.006020	.005398	30
.002902	.008539	.002840	.001350	.000843	.000723	.000511	.000841	.000608	.000544	31
.002855	.002904	.004214	.003268	.003284	.001847	.002013	.003317	.002231	.002024	32
.000527	.000721	.000510	.000378	.000370	.000240	.000357	.001101	.000301	.000312	33
.000083	.000096	.000130	.000473	.000489	.013402	.001435	.003299	.004082	.003645	34
.000703	.000801	.000981	.000984	.001012	.002153	.000662	.001626	.001043	.000933	35
.001019	.001242	.001497	.000925	.001041	.000683	.000678	.001065	.000758	.000678	36
.001743	.002640	.006323	.002117	.000977	.000875	.000885	.001941	.000866	.000726	37
.008114	.013039	.069883	.002061	.001264	.000930	.000961	.002458	.001004	.000901	38
.001010	.001153	.001367	.002699	.002613	.000778	.000650	.001124	.000757	.000682	39
.024242	.033592	.024043	.189701	.031167	.044370	.039604	.048753	.040926	.022342	40
.021515	.031451	.015157	.011457	.007100	.002679	.004019	.026081	.003129	.012614	41
.000124	.000119	.000168	.000114	.000141	.000088	.000086	.000142	.000102	.000091	42
.001873	.001906	.002573	.001953	.019376	.001201	.001402	.004733	.003492	.011257	43
.013810	.023507	.014692	.008877	.008177	.010423	.010072	.008648	.009682	.007738	44
.091052	.094299	.080791	.050507	.067508	.047276	.074274	.067189	.060245	.059246	45
.008028	.015953	.015859	.017818	.009884	.018874	.012278	.013309	.014184	.010656	46
.099189	.109896	.093008	.073297	.085203	.051570	.059056	.076520	.083653	.072654	47
.086609	.080011	.126451	.082566	.103563	.057688	.062056	.106099	.070636	.063204	48
2.025162	2.503044	1.951004	1.803307	1.670027	1.822061	1.587549	1.993274	1.920686	1.771169	49

Table III – Total Requirements Table, Niagara Region, 1967 – Continued
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Wood Industries	Furniture and Fixtures	Pulp and Paper Mills	Paper Products	Printing and Publishing	Iron and Steel Mills
	Industry	17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	.004209	.003794	.011068	.009187	.005568	.003090
2	Mining	.000431	.000926	.002230	.002183	.000641	.003060
3	Meat and Poultry	.000553	.000673	.001308	.001503	.001121	.000599
4	Dairy Products	.000612	.000725	.000836	.001065	.001051	.000663
5	Fruit and Vegetable Products	.000510	.000612	.003081	.002400	.001321	.000528
6	Grain Mills	.000793	.000743	.002511	.002178	.001190	.000607
7	Biscuits and Bakeries	.000222	.000273	.000331	.001806	.000424	.000227
8	Other Food Industries	.001048	.001231	.014448	.009182	.004066	.001056
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.000147	.000181	.000293	.000307	.000275	.000178
10	Rubber Products	.001977	.003156	.002416	.002892	.002571	.002136
11	Leather and Leather Products	.000069	.000081	.000119	.000142	.000116	.000088
12	Cotton, Wool and Synthetic Textile Mills	.000927	.005322	.000737	.006531	.000648	.000386
13	Other Primary Textile Mills	.000166	.000276	.000368	.000828	.000171	.000098
14	Other Textile Industries	.000267	.000322	.000356	.000453	.000382	.000318
15	Knitting Mills	.000008	.000017	.000003	.000022	.000003	.000002
16	Clothing Industries	.000055	.000045	.000052	.000058	.000045	.000040
17	Wood Industries	1.023218	.093126	.000464	.000493	.000343	.004198
18	Furniture and Fixtures	.020701	1.007443	.000023	.000025	.000020	.000094
19	Pulp and Paper Mills	.054555	.014175	1.486241	.535821	.257953	.006785
20	Paper Products	.004483	.007760	.034767	1.036669	.023988	.002715
21	Printing and Publishing	.004793	.006049	.007330	.011408	1.054813	.006836
22	Iron and Steel Mills	.012327	.168783	.014724	.020156	.010750	1.129994
23	Iron Foundries	.000692	.007988	.000613	.000728	.000531	.012946
24	Other Primary Metals Industries	.001800	.010801	.001425	.002821	.001148	.028
25	Fabricated and Structural Metal	.000702	.009569	.000761	.000865	.000724	.000
26	Ornamental and Architectural Metal	.000112	.000303	.000185	.000194	.000141	.000127
27	Metal Stamping, Pressing and Coating	.007230	.158820	.004191	.004954	.005168	.002425
28	Wire and Wire Products	.004390	.018709	.002465	.002988	.002620	.002488
29	Hardware, Tool and Cutlery	.009832	.016265	.001178	.001466	.001090	.001468
30	Other Metal Fabricating Industries	.007400	.132066	.006685	.007820	.006992	.008508
31	Miscellaneous Machinery	.002350	.085418	.000697	.000729	.000597	.000554
32	Motor Vehicle Parts and Accessories	.001897	.007095	.002452	.002913	.002594	.003539
33	Other Transportation Equipment	.003670	.001010	.000371	.000458	.000265	.000292
34	Electrical Appliances	.000062	.000137	.000071	.000141	.000071	.000160
35	Electrical Industrial Equipment	.000755	.003093	.000586	.000697	.000623	.000588
36	Communication and Other Electrical Equipment	.000616	.001045	.000836	.000970	.000938	.001134
37	Gypsum, Concrete, Stone and Clay Products	.002406	.003347	.007532	.007845	.001949	.015438
38	Other Non-metallic Mineral Products	.022706	.006615	.013357	.009444	.003049	.001632
39	Paint and Varnish	.002282	.009114	.000920	.001050	.000882	.000689
40	Industrial Chemicals, Soap and Toilet Products	.009400	.014109	.093270	.106782	.042516	.014856
41	Other Chemical Industries, Petroleum and Coal Products	.001833	.007685	.005837	.030925	.003071	.003295
42	Scientific and Professional Equipment	.000070	.000100	.000101	.000123	.000457	.000093
43	Miscellaneous Manufacturing Industries	.007925	.003219	.001682	.004528	.001770	.001352
44	Construction, Maintenance and Repair	.007688	.008297	.012664	.013712	.010010	.008772
45	Transportation, Storage and Trade	.103939	.069104	.078499	.080686	.048521	.048750
46	Utilities	.012519	.011016	.062703	.034541	.017252	.027694
47	Communications and Other Services	.053563	.064262	.064826	.089612	.099996	.044259
48	Unallocated Sector	.049253	.061787	.074580	.088370	.084135	.071382
49	Total	1.447164	2.026688	2.022195	2.140672	1.704570	1.465679

Note: Figures may not add to total due to rounding.

Iron Foundries	Other Primary Metals Industries	Fabricated and Structural Metal	Ornamental and Archi- tectural Metal	Metal Stamping, Pressing and Coating	Wire and Wire Products	Hardware, Tool and Cutlery	Other Metal Fabricating Industries	Miscel- laneous Machinery	Motor Vehicle Parts and Accessories	Industry No.
23	24	25	26	27	28	29	30	31	32	
.003961	.004419	.003539	.004530	.004079	.003709	.004427	.004050	.004610	.003445	1
.009574	.001800	.001630	.001163	.001789	.001545	.000961	.001803	.001646	.003358	2
.000702	.000865	.000744	.000951	.000794	.000722	.000975	.000853	.000872	.000614	3
.000801	.000836	.000838	.001061	.000831	.000802	.001105	.000962	.000986	.000677	4
.000578	.000818	.000608	.000783	.000758	.000612	.000790	.000693	.000726	.000523	5
.000761	.000882	.000697	.000895	.000817	.000728	.000880	.000799	.000898	.000666	6
.000285	.000304	.000307	.000399	.000308	.000301	.000418	.000358	.000367	.000245	7
.000886	.002067	.000876	.001140	.001742	.001047	.001041	.000957	.001090	.000924	8
.000201	.000217	.000225	.000287	.000209	.000209	.000293	.000250	.000242	.000178	9
.003141	.002813	.003570	.003486	.002738	.002418	.003489	.008017	.009484	.010037	10
.000092	.000102	.000105	.000135	.000099	.000098	.000137	.000113	.000105	.000084	11
.000561	.001055	.000552	.000655	.000552	.000531	.000679	.000993	.001141	.011103	12
.000140	.000177	.000117	.000149	.000136	.000128	.000148	.000143	.000169	.000305	13
.000354	.001164	.000381	.000483	.000341	.000371	.000477	.000437	.000429	.000373	14
.000003	.000004	.000003	.000005	.000009	.000003	.000006	.000004	.000005	.000032	15
.000051	.000052	.000046	.000060	.000046	.000047	.000058	.000052	.000057	.000045	16
.001799	.002183	.002083	.001701	.003058	.002167	.005530	.002224	.002450	.001838	17
.000051	.000063	.000053	.000047	.000073	.000056	.000124	.000059	.000100	.000050	18
.005463	.007966	.005731	.009243	.010857	.010931	.010779	.006345	.008420	.005937	19
.002934	.005995	.003064	.007911	.007486	.013065	.008601	.004148	.006042	.004733	20
.007079	.007318	.008288	.010545	.006836	.007711	.010570	.008815	.008043	.006521	21
.370032	.420438	.473803	.332625	.536495	.446991	.180442	.311680	.278103	.225336	22
1.011745	.010287	.011614	.005134	.006582	.005684	.007600	.028902	.041252	.057310	23
.015996	1.056052	.018551	.027675	.021641	.036132	.017302	.031514	.033492	.020372	24
.02841	.001336	1.013722	.002604	.000823	.001354	.002060	.075661	.014485	.002014	25
.000244	.000268	.000733	1.000389	.001245	.000153	.000300	.000291	.000279	.000178	26
.008326	.012036	.007849	.227272	1.003298	.002289	.105198	.013629	.075157	.010636	27
.010235	.005273	.022868	.091299	.030268	1.215733	.013275	.028153	.013909	.003540	28
.001746	.003154	.001833	.001924	.002500	.001560	1.007357	.004184	.003427	.015574	29
.176177	.012549	.189839	.026229	.008420	.015491	.025962	1.061551	.199765	.024381	30
.004934	.000844	.005815	.009796	.000600	.000777	.004770	.027810	1.018363	.001039	31
.007021	.048323	.007721	.005117	.003219	.004209	.004624	.027748	.031056	1.011248	32
.000881	.000912	.013484	.000437	.000326	.000356	.000414	.003521	.001004	.000738	33
.000125	.003937	.000144	.000185	.000146	.000196	.000149	.000198	.000198	.000231	34
.002308	.001397	.002492	.001672	.003512	.000714	.035821	.011247	.007601	.001261	35
.001290	.006057	.001443	.001385	.001216	.001110	.001261	.003143	.001723	.000947	36
.009913	.009613	.006991	.005611	.007844	.010167	.005473	.005314	.004860	.007648	37
.001141	.003252	.001212	.005071	.001539	.001281	.001457	.001405	.001929	.007592	38
.001577	.001020	.002013	.004703	.015074	.000809	.004224	.002712	.005932	.001493	39
.011327	.034895	.010646	.013226	.021846	.014114	.011096	.011418	.012360	.012169	40
.002005	.006015	.002051	.002503	.003485	.002332	.003034	.002092	.002490	.006458	41
.000112	.000107	.000131	.000147	.000098	.000106	.000151	.000199	.000195	.000092	42
.001499	.001610	.001657	.003949	.009961	.001511	.006160	.001869	.002229	.001419	43
.014509	.019765	.010237	.009944	.009937	.011250	.009545	.011475	.013093	.012509	44
.077724	.064444	.053989	.069333	.059378	.062033	.062895	.062677	.083299	.065042	45
.025433	.033851	.017689	.014822	.019973	.021410	.013316	.015510	.016383	.019999	46
.064646	.068818	.065529	.084530	.072553	.062461	.091406	.081087	.088963	.051775	47
.073660	.076020	.086549	.109893	.070814	.078772	.110201	.091903	.082539	.067814	48
1.946864	1.943372	2.064065	2.103103	1.956351	2.046196	1.776980	1.958969	2.081967	1.680505	49

Table III – Total Requirements Table, Niagara Region, 1967 – Continued
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Other Transportation Equipment	Electrical Appliances	Electrical Industrial Equipment	Communication and Other Electrical Equipment	Gypsum, Concrete, Stone and Clay Products	Other Non-metallic Mineral Products
	Industry	33	34	35	36	37	38
1	Agriculture, Forestry and Fishing	.003861	.004878	.003202	.004880	.009101	.005560
2	Mining	.001139	.001068	.000674	.000812	.037257	.004093
3	Meat and Poultry	.000694	.000980	.000682	.001073	.001040	.001116
4	Dairy Products	.000781	.001028	.000785	.001078	.004891	.001382
5	Fruit and Vegetable Products	.000578	.000913	.000541	.000981	.001339	.001070
6	Grain Mills	.000745	.000982	.000631	.000993	.001709	.001118
7	Biscuits and Bakeries	.000287	.000411	.000299	.000411	.000411	.000429
8	Other Food Industries	.000888	.001950	.000635	.002190	.004107	.002601
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.000191	.000269	.000196	.000256	.000297	.000297
10	Rubber Products	.012891	.004605	.002270	.018826	.003173	.003224
11	Leather and Leather Products	.000083	.000122	.000085	.000107	.000129	.000139
12	Cotton, Wool and Synthetic Textile Mills	.001209	.001706	.001181	.003265	.000784	.004358
13	Other Primary Textile Mills	.000165	.000175	.000118	.000227	.000207	.000231
14	Other Textile Industries	.000390	.000443	.000319	.001493	.000462	.000512
15	Knitting Mills	.000005	.000007	.000004	.000010	.000004	.000014
16	Clothing Industries	.000047	.000055	.000039	.000053	.000066	.000058
17	Wood Industries	.001682	.001310	.001549	.001937	.002203	.001387
18	Furniture and Fixtures	.000051	.000042	.000041	.000052	.000060	.000044
19	Pulp and Paper Mills	.004803	.017972	.005997	.009790	.081056	.024285
20	Paper Products	.003033	.026292	.006253	.010697	.018357	.021893
21	Printing and Publishing	.006296	.009176	.006622	.007531	.009885	.010678
22	Iron and Steel Mills	.233060	.247685	.139679	.045888	.028037	.020270
23	Iron Foundries	.020427	.005416	.012635	.005766	.001200	.004115
24	Other Primary Metals Industries	.020730	.020547	.012625	.037534	.002394	.001555
25	Fabricated and Structural Metal	.007762	.001499	.003486	.002197	.001281	.000555
26	Ornamental and Architectural Metal	.000185	.000142	.000113	.000148	.000199	.000209
27	Metal Stamping, Pressing and Coating	.007354	.004241	.002318	.003721	.005673	.002714
28	Wire and Wire Products	.005660	.072107	.067147	.019059	.014822	.005047
29	Hardware, Tool and Cutlery	.002478	.001499	.001552	.001345	.034738	.004043
30	Other Metal Fabricating Industries	.096263	.017878	.046540	.027316	.013606	.011109
31	Miscellaneous Machinery	.054511	.020901	.001524	.002472	.001022	.000862
32	Motor Vehicle Parts and Accessories	.023135	.004792	.006067	.005025	.004272	.003467
33	Other Transportation Equipment	1.232297	.000498	.000378	.032893	.000462	.000460
34	Electrical Appliances	.000918	1.006067	.000107	.000248	.000092	.000128
35	Electrical Industrial Equipment	.001941	.129457	1.001972	.032593	.001964	.000963
36	Communication and Other Electrical Equipment	.003761	.005402	.000889	1.342592	.001120	.003180
37	Gypsum, Concrete, Stone and Clay Products	.004074	.005395	.002944	.005606	1.019689	.082795
38	Other Non-metallic Mineral Products	.002232	.002383	.005666	.039870	.019644	1.150625
39	Paint and Varnish	.004480	.015696	.001252	.001205	.001284	.001078
40	Industrial Chemicals, Soap and Toilet Products	.010551	.023907	.006822	.036385	.021993	.038065
41	Other Chemical Industries, Petroleum and Coal Products	.002428	.004811	.001542	.004185	.003346	.020881
42	Scientific and Professional Equipment	.000452	.000848	.000166	.000124	.000138	.000144
43	Miscellaneous Manufacturing Industries	.001352	.001873	.001384	.001567	.002185	.002099
44	Construction, Maintenance and Repair	.012690	.010002	.007951	.010603	.013900	.015821
45	Transportation, Storage and Trade	.072188	.069426	.048671	.059377	.093180	.067643
46	Utilities	.014734	.014230	.012507	.011596	.019188	.088442
47	Communications and Other Services	.070075	.088162	.070658	.106185	.087990	.089950
48	Unallocated Sector	.065345	.094855	.068831	.077123	.102388	.107266
49	Total	2.010901	1.944104	1.557546	1.979284	1.672345	1.808778

Note: Figures may not add to total due to rounding.

Paint and Varnish	Industrial Chemicals, Soap and Toilet Products	Other Chemical Industries, Petroleum and Coal Products	Scientific and Professional Equipment	Miscel- laneous Manufac- turing Industries	Con- struction, Maintenance and Repair	Trans- portation, Storage and Trade	Utilities	Communi- cations and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	
.026362	.039343	.022359	.005058	.007100	.006145	.027283	.002066	.018321	.023104	1
.003346	.005013	.020007	.000817	.016593	.010449	.000452	.000686	.000689	.001116	2
.003506	.008056	.004194	.001142	.001520	.000665	.001219	.000517	.006238	.005968	3
.001541	.001445	.001258	.001188	.001334	.000910	.001525	.000634	.007935	.006466	4
.008195	.011996	.006489	.001001	.001397	.000582	.000829	.000397	.004716	.004576	5
.005912	.008733	.004913	.001025	.001425	.001089	.004629	.000418	.003995	.004642	6
.000561	.000530	.000508	.000454	.000528	.000285	.000436	.000241	.003091	.002450	7
.040220	.060882	.031574	.001927	.003597	.001009	.000948	.000312	.002381	.004923	8
.000642	.000733	.000514	.000316	.000376	.000151	.000258	.000123	.001199	.002249	9
.005662	.004879	.004100	.008370	.041759	.005467	.005225	.001026	.002079	.029084	10
.000280	.000535	.000314	.001020	.001006	.000069	.000111	.000039	.000178	.001205	11
.000960	.001077	.001074	.003438	.006967	.001177	.002620	.000299	.002594	.003506	12
.000303	.000390	.000308	.000668	.001664	.001606	.001050	.000128	.000513	.000668	13
.000629	.000582	.000538	.000728	.000853	.001120	.000949	.000197	.001037	.003775	14
.000006	.000007	.000006	.000445	.000778	.000007	.000009	.000001	.000009	.000024	15
.000076	.000072	.000071	.000061	.000304	.000052	.000405	.000018	.000054	.000401	16
.000742	.001015	.001823	.001775	.003228	.016170	.000647	.000897	.001938	.001095	17
.000031	.000039	.000057	.005112	.000168	.001108	.000049	.000060	.000110	.000058	18
.027937	.072087	.054569	.025101	.028141	.014869	.009598	.002047	.005465	.042627	19
.021161	.049383	.060238	.010592	.025551	.008898	.008555	.001206	.003598	.023336	20
.013917	.012555	.012742	.010984	.014806	.003605	.007988	.002836	.005782	.100709	21
.066699	.124001	.175819	.069401	.076288	.070139	.008804	.005227	.007669	.051989	22
.001450	.002101	.002724	.003591	.002635	.009718	.000838	.000648	.000791	.004534	23
.004375	.008944	.007677	.031365	.035446	.021486	.001354	.001298	.001731	.006924	24
.01175	.001226	.001320	.006050	.001533	.026887	.001162	.001510	.001734	.006160	25
.000285	.000333	.000304	.000180	.000177	.012224	.000336	.000622	.000698	.000327	26
.049142	.022094	.011381	.029192	.013227	.016330	.001793	.001088	.001788	.005520	27
.005603	.004566	.004021	.009722	.014871	.013460	.002917	.001409	.002505	.029173	28
.001879	.001778	.001681	.002187	.004290	.005783	.001139	.000591	.000958	.012379	29
.012162	.011647	.012386	.028558	.017819	.060678	.008972	.005204	.007368	.079892	30
.001240	.001412	.001257	.002729	.001645	.004052	.001638	.001547	.001401	.005368	31
.004572	.004362	.004515	.005349	.006427	.004872	.004673	.001046	.001834	.030994	32
.000573	.000587	.003264	.006029	.000759	.001100	.003801	.000138	.000207	.001785	33
.000125	.000139	.000132	.000233	.001354	.001242	.000104	.000081	.000124	.000701	34
.001156	.001013	.000952	.008239	.002360	.006983	.000696	.000522	.000719	.006855	35
.001482	.001442	.001369	.230507	.002181	.008937	.001377	.000687	.001068	.009507	36
.002769	.005484	.005268	.004403	.003827	.044267	.001301	.002301	.002674	.002833	37
.006735	.008785	.009439	.034542	.005570	.008006	.000942	.000607	.001398	.006837	38
1.030478	.002718	.003445	.002454	.002697	.003512	.000804	.000424	.001201	.008689	39
.351120	1.222427	.554539	.027247	.053861	.010579	.007231	.002471	.007957	.050511	40
.045472	.051420	1.074680	.009349	.057734	.002745	.002620	.000530	.002122	.006983	41
.000191	.000169	.000159	1.006871	.000184	.000167	.000124	.000050	.000261	.001306	42
.003740	.005129	.003541	.005439	1.042452	.003675	.002120	.000670	.001874	.018114	43
.013746	.017689	.019478	.010692	.011826	1.007898	.022208	.050883	.053969	.021151	44
.086417	.086228	.092264	.060658	.065795	.095382	1.062175	.021155	.028759	.229330	45
.022094	.053469	.038636	.011557	.014667	.007180	.010555	1.213859	.005202	.010677	46
.120314	.103150	.093867	.101606	.108901	.082100	.116538	.074891	1.131582	.318933	47
.142430	.125766	.117697	.114070	.137227	.036532	.077246	.027093	.053503	1.058767	48
2.139413	2.147432	2.469472	1.903442	1.844848	1.641364	1.418250	1.430699	1.393021	2.248219	49

**Sectoral Classification of the 1967 Niagara Region Input-Output Table —
Industry Titles and Definitions on the Basis of the Standard Industrial Classification¹**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
1	Agriculture, Forestry and Fishing	011, 013, 015, 017, 019, 021, 031, 039, 041, 045, 047
2	Mining	051, 052, 053, 054, 055, 056, 057, 058, 059, 061, 063, 065, 066, 071, 073, 077, 079, 083, 087, 092, 094, 096, 098, 099
3	Meat and Poultry	101, 103
4	Dairy Products	105, 107
5	Fruit and Vegetable Products	112
6	Grain Mills	123, 124, 125
7	Biscuits and Bakeries	128, 129
8	Other Food Industries	111, 131, 133, 135, 139
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	141, 147, 143, 145, 151, 153
10	Rubber Products	161, 163, 169
11	Leather and Leather Products	172, 174, 175, 179
12	Cotton, Wool and Synthetic Textile Mills	183, 193, 197, 201
13	Other Primary Textile Mills	211, 212, 213, 214, 215, 216, 218, 219
14	Other Textile Industries	221, 223, 229
15	Knitting Mills	231, 239
16	Clothing Industries	243, 244, 245, 246, 247, 248, 249
17	Wood Industries	251, 252, 254, 256, 258, 259
18	Furniture and Fixtures	261, 264, 266, 268
19	Pulp and Paper Mills	271
20	Paper Products	272, 273, 274
21	Printing and Publishing	286, 287, 288, 289
22	Iron and Steel Mills	291
23	Iron Foundries	294
24	Other Primary Metal Industries	292, 295, 296, 297, 298
25	Fabricated and Structural Metal	302
26	Ornamental and Architectural Metal	303
27	Metal Stamping, Pressing and Coating	304
28	Wire and Wire Products	305
29	Hardware, Tool and Cutlery	306
30	Other Metal Fabricating Industries	301, 307, 308, 309, 315
31	Miscellaneous Machinery	311, 316, 318
32	Motor Vehicle Parts and Accessories	325
33	Other Transportation Equipment	321, 323, 324, 326, 327, 328, 329
34	Electrical Appliances	331, 332
35	Electrical Industrial Equipment	336
36	Communication and Other Electrical Equipment	334, 335, 337, 338, 339
37	Gypsum, Concrete, Stone and Clay Products	345, 347, 348, 351, 352, 353
38	Other Non-metallic Mineral Products	341, 343, 354, 355, 356, 357, 359
39	Paint and Varnish	375
40	Industrial Chemicals, Soap and Toilet Products	376, 377, 378, 379

¹Standard Industrial Classification based on 1960 code.

**Sectoral Classification of the 1967 Niagara Region Input-Output Table —
Industry Titles and Definitions on the Basis of the Standard Industrial Classification¹
(Continued)**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
41	Other Chemical Industries, Petroleum and Coal Products	365, 369, 371, 372, 373, 374
42	Scientific and Professional Equipment	381
43	Miscellaneous Manufacturing Industries	382, 383, 384, 385, 393, 395, 397, 398, 399
44	Construction, Maintenance and Repair	404, 406, 409, 421
45	Transportation, Storage and Trade	602, 604, 606, 608, 611, 613, 614, 615, 616, 617, 618, 619, 621, 622, 623, 624, 625, 626, 627, 629, 631, 642, 647, 649, 652, 654, 656, 658, 663, 665, 667, 669, 673, 676, 678, 681, 691, 692, 693, 694, 695, 696, 697, 699, 501, 502, 504, 505, 506, 507, 508, 509, 512, 515, 516, 517, 519, 524, 527
46	Utilities	572, 574, 576, 579
47	Communications and Other Services	543, 544, 545, 548, 801, 803, 805, 807, 809, 821, 823, 825, 827, 828, 842, 851, 853, 859, 871, 872, 873, 874, 875, 876, 877, 878, 879, 894, 896, 897, 702, 704, 731, 735, 861, 862, 864, 866, 869, 737, 831, 891, 893, 899
48	Unallocated Sector	

¹Standard Industrial Classification based on 1960 code.

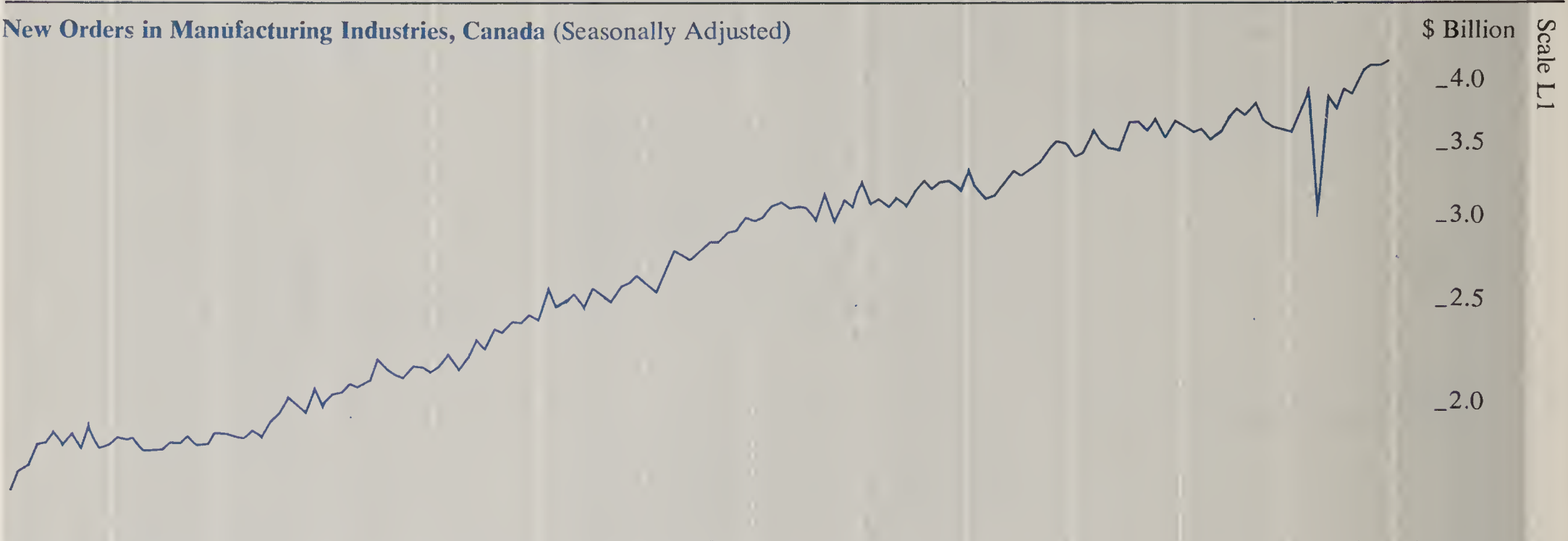
Selected Economic Indicators

Leading Indicators

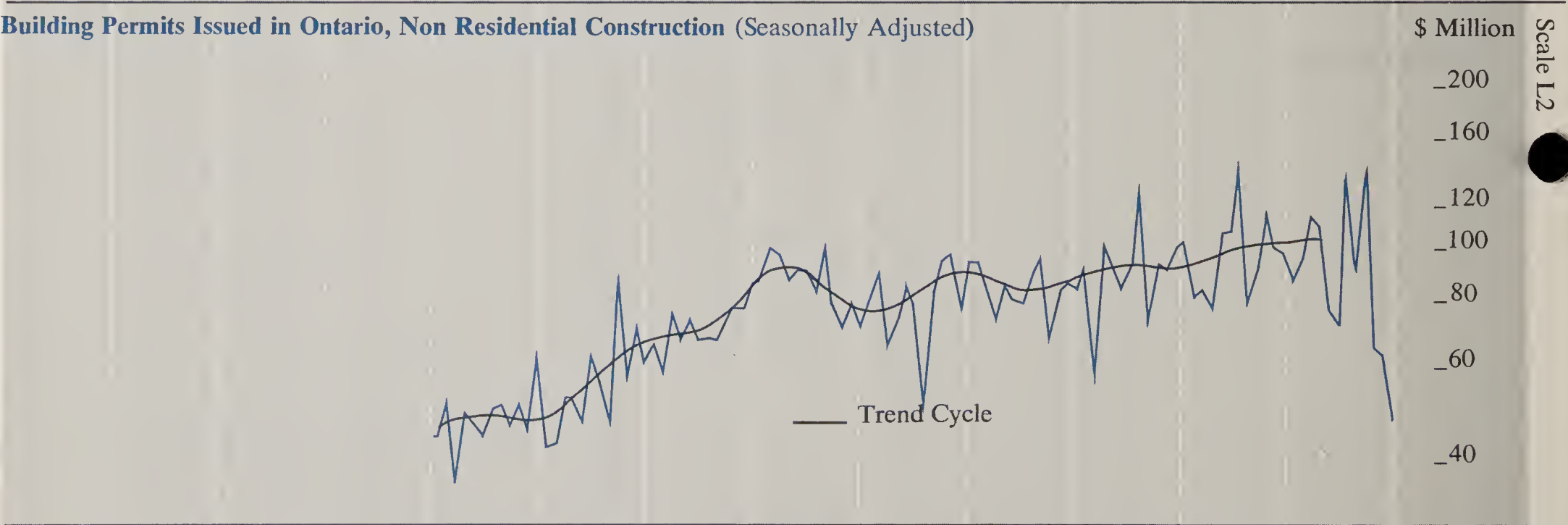
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



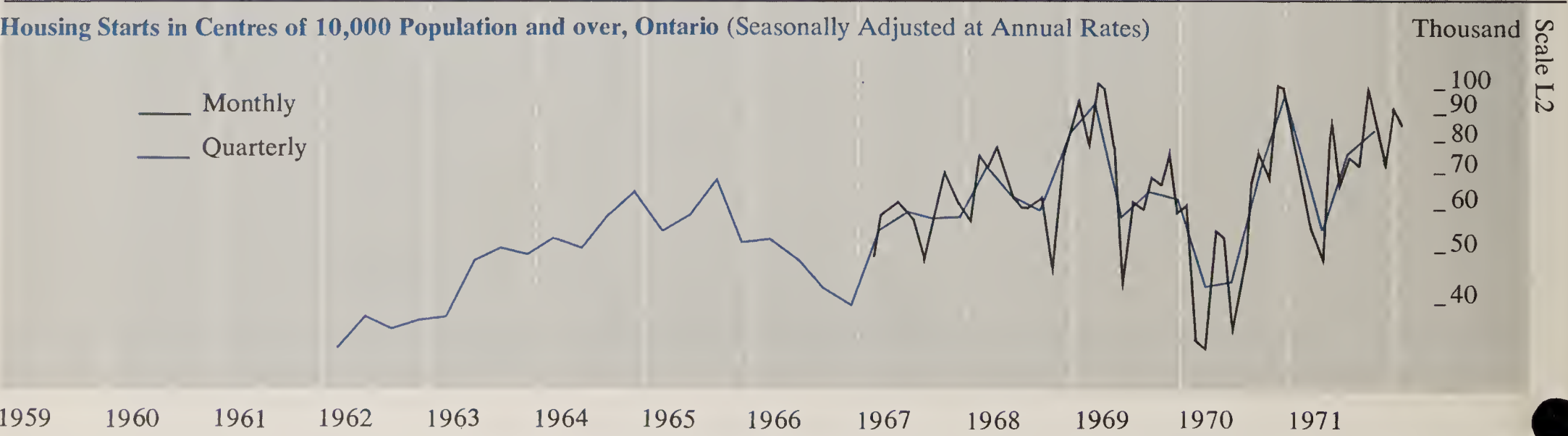
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



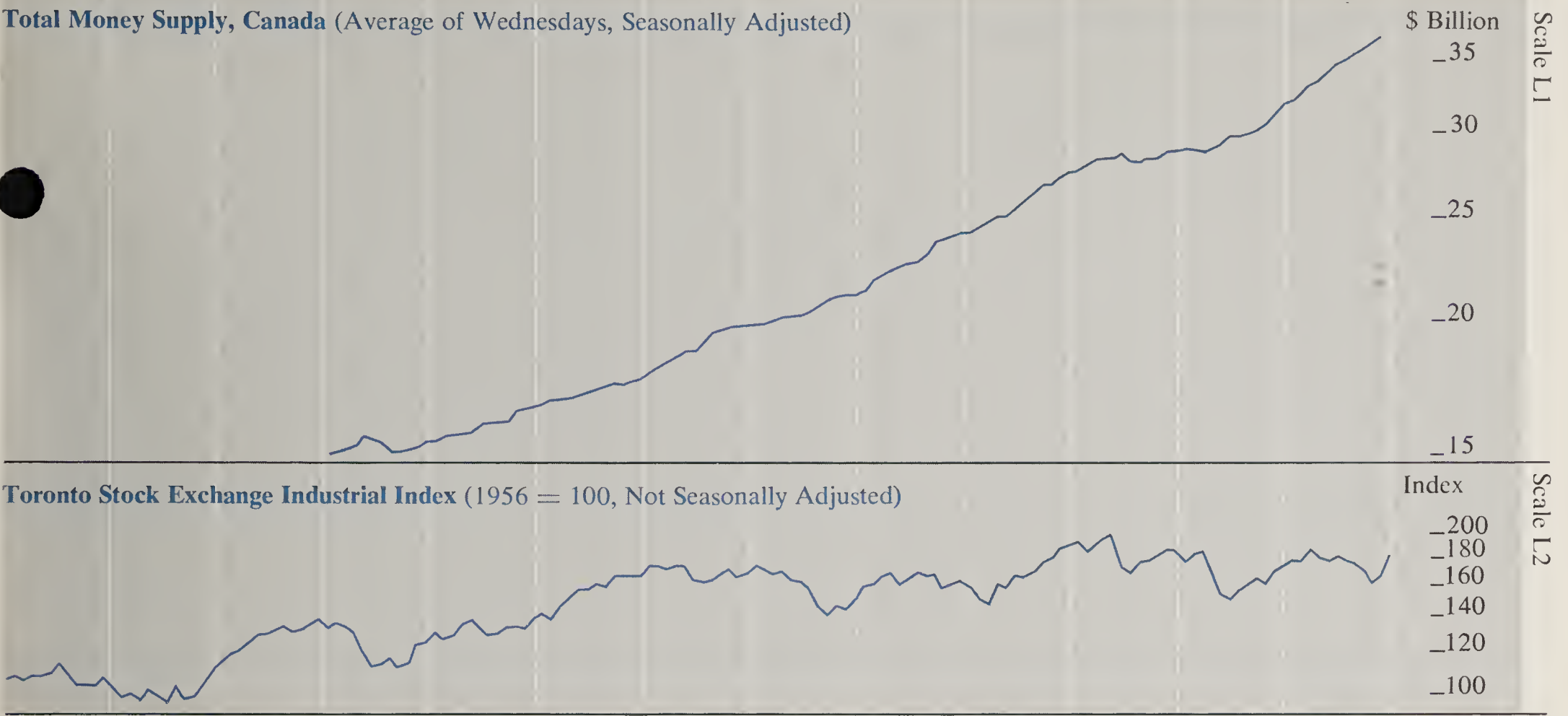
Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



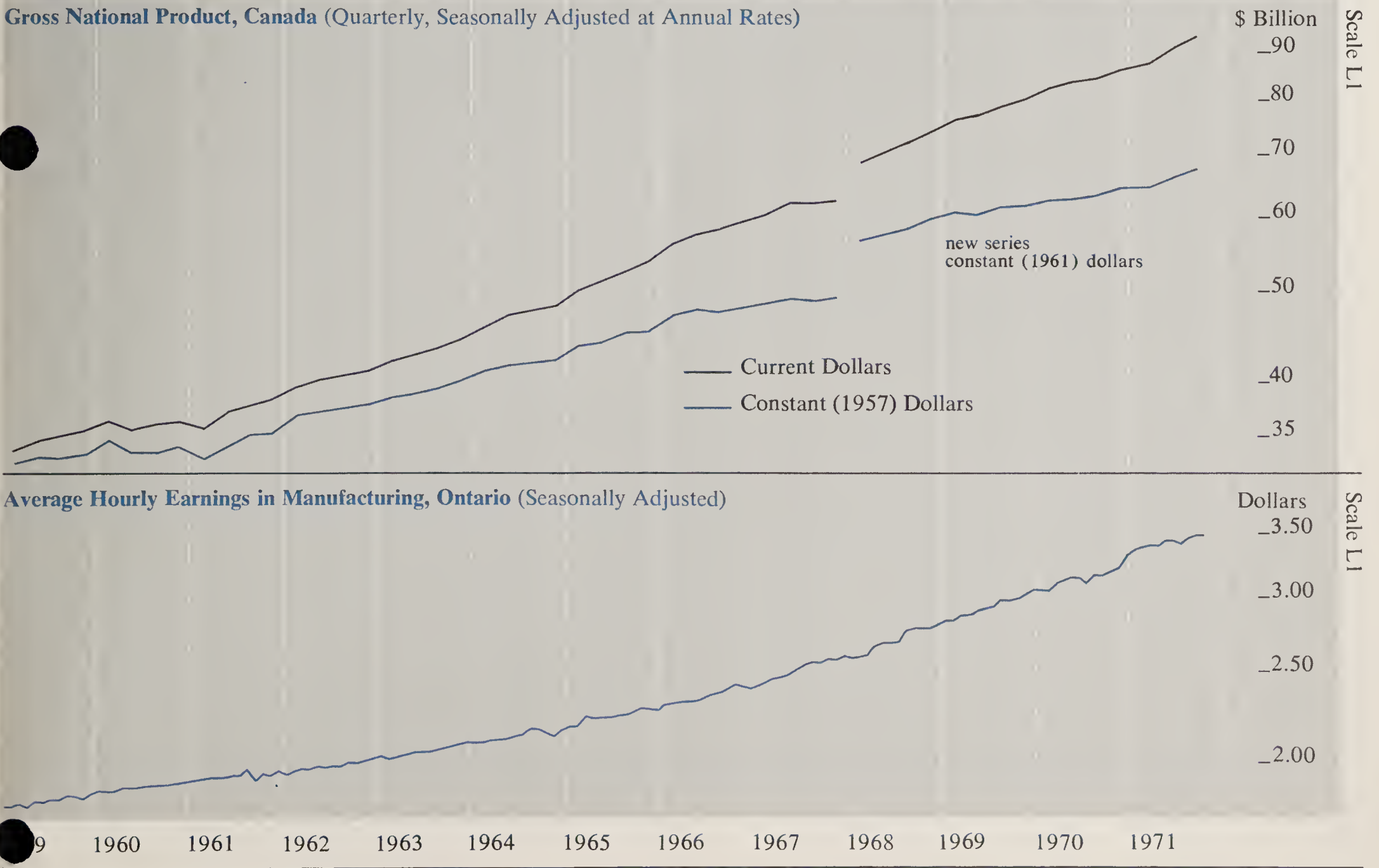
Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Leading Indicators



Coincidental and Lagging Indicators



Coincidental and Lagging Indicators

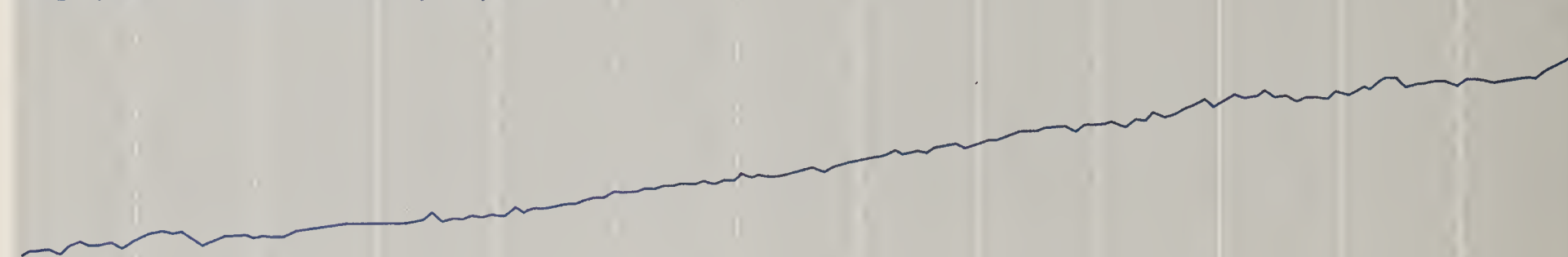
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent
Scale A
_8.0
_7.0
_6.0
_5.0
_4.0
_3.0
_2.0



Employment, Ontario (Seasonally Adjusted)

Million
Scale L1
_3.25
_3.00
_2.75
_2.50
_2.25



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)

Per Cent
Scale A
_2.0
_3.0
_4.0
_5.0
_6.0



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index
Scale L2
_400
_300
_200
_100
_70
_50



1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971

1970 1971

Nov. Dec. Jan. Feb. March April May June July Aug. Sept. Oct. Nov. Dec.

Leading Indicators

Average Weekly Hours Worked in Manufacturing	Number	39.4	40.1	39.2	38.8	39.3	39.9	39.2	40.0	39.8	39.8	39.9	40.1
New Orders in Manufacturing Industries ^c	\$ Million	3,689	3,686	3,885	4,034	3,097	3,975	3,961	4,000	4,184	4,335	4,217	4,243
Building Permits Issued in Ontario, Non-Residential Construction	\$ Million	100.0	90.6	97.0	117.5	112.0	77.1	74.9	139.8	92.6	146.2	67.3	48.4
Urban Housing Starts (Annual Rate)	Number	103,800	82,300	60,600	55,600	48,400	88,000	67,900	75,000	73,000	99,400	82,900	98,500
Money Supply ^c	\$ Million	31,197	31,696	32,135	32,511	33,144	33,495	34,292	34,896	35,016	35,393	35,950	36,926
T.S.E. Industrial Index ^u	1956 = 100	168.7	174.4	178.1	177.4	185.3	181.6	177.8	180.7	177.5	176.3	169.88	166.16
Business Failures ^u	Number	74	71	71	70	100	81	88	66	60	55	40	78
Business Failures — Liabilities ^u	\$ Million	5.8	7.7	11.6	4.5	5.2	3.8	3.4	5.3	8.0	5.3	2.1	5.6
													5.7
													3.7

Coincidental and Lagging Indicators

Gross National Product ^c (Annual Rate)	\$ Million	86,376	88,372	91,392	93,676								
Average Hourly Earnings in Manufacturing	Dollars	3.22	3.33	3.37	3.40	3.43	3.43	3.45	3.45	3.46	3.47	3.49	3.49
3-Month Treasury Bill Rate ^{c,u}	Per Cent	4.40	4.44	4.68	4.06	3.16	3.00	3.03	3.37	3.68	3.79	4.06	3.47
Cheques Cashed in Clearing Centres ¹	\$ Million	6,475	6,553	6,589	7,190	7,956	7,519	7,062	7,110	7,457	7,843	7,988	8,215
Retail Trade	\$ Million	903	910	900	941	947	995	992	989	983	972	1,000	1,001
Labour Force	000's	3,167	3,151	3,215	3,223	3,197	3,207	3,232	3,231	3,230	3,232	3,288	3,306
Employed	000's	3,020	2,996	3,042	3,054	3,040	3,023	3,052	3,067	3,083	3,071	3,105	3,120
Unemployed	000's	156	162	173	169	157	184	180	164	147	161	183	186
Unemployed as % of Labour Force	Per Cent	4.9	5.1	5.4	5.2	4.9	5.7	5.6	5.1	4.6	5.0	5.6	5.6
Wages and Salaries	\$ Million	1,611	1,618	1,640	1,669	1,685	1,707	1,742	1,753	1,747	1,766	1,773	1,773
Index of Industrial Employment	1961 = 100	129.7	132.0	131.5	132.2	131.7	131.5	132.7	132.6	132.2	132.8	132.4	132.4

Index of Industrial Production ^c	1961 = 100	171.5	170.5	171.7	172.9	172.5	171.2	174.7	175.7	176.3	179.5	180.5	181.7
Total Manufacturing ^c		165.5	165.1	167.1	169.0	168.3	167.5	171.2	172.0	171.9	175.1	176.1	178.4
Non-Durables ^c		155.3	152.9	152.7	150.3	150.5	150.1	154.1	155.1	154.7	156.3	156.8	158.5
Durables ^c		178.4	180.6	185.3	192.7	190.9	189.4	192.8	193.5	193.7	198.9	200.5	203.5
Mining ^c		186.7	180.9	177.4	176.0	176.6	174.4	179.3	180.6	184.0	184.4	185.6	183.2
Electric Power and Gas Utilities ^c		194.8	201.0	203.2	201.9	202.2	198.5	197.4	198.6	202.1	208.9	210.6	208.1
Primary Energy Demand (Annual Rate)	BKWH	64.32	66.79	67.62	67.76	68.14	67.21	65.74	67.86	67.33	69.82	71.13	68.06
Exports (including re-exports) ^c	\$ Million	1,479.8	1,312.0	1,442.0	1,395.0	1,506.0	1,397.0	1,463.6	1,550.0	1,456.7	1,523.9	1,526.6	1,556.6
Imports ^c	\$ Million	1,138.0	1,020.0	1,128.0	1,181.4	1,338.8	1,181.2	1,279.9	1,344.0	1,316.9	1,387.5	1,283.9	1,464.7
													1,359.0
													1,337.0

Unclassified Indicators

Foreign Exchange Reserves ^{c,u}	U.S. \$ Million	3,871	3,813	3,816	3,868	3,944	3,962	3,998	3,977	4,056	4,319	4,308	4,379
Industrial Materials Price Index ^{c,u}	1935-39 = 100	266.4	264.2	264.2	266.0	266.4	267.6	267.1	267.4	266.6	267.4	267.1	266.9
Consumer Price Index ^{c,u}	1961 = 100	130.3	129.8	130.3	130.9	131.3	132.2	132.7	133.0	134.1	135.0	134.7	134.9
Toronto ^u		127.3	126.1	126.7	127.2	127.7	128.3	129.2	129.5	130.2	130.6	130.7	130.2
Ottawa ^u		127.6	127.2	127.5	128.3	129.0	129.7	130.5	130.9	131.8	132.0	131.7	131.6
Thunder Bay ^u		—	—	102.0	102.3	102.6	103.0	103.5	103.7	104.2	104.6	105.2	104.8
Purchasing Power of 1961 Consumer Dollar ^{c,u}	1969 = 100	—	—	0.77	0.76	0.76	0.76	0.75	0.75	0.75	0.74	0.74	0.74
													0.73

^cStatistics for Canada. ^uNot seasonally adjusted.¹Ontario less Toronto.



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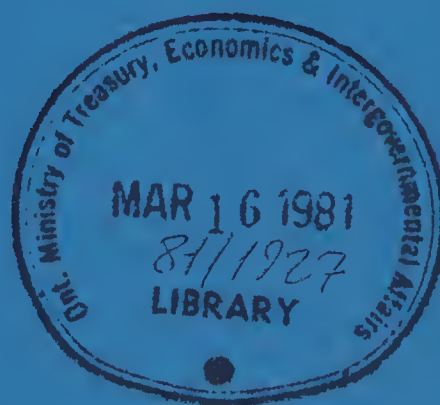
Ontario Economic Review

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March/April 1972
Volume 10, Number 2

Department of Treasury and Economics

Hon. W. Darcy McKeough, Treasurer of Ontario
and Minister of Economics
H. Ian Macdonald, Deputy Minister



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VOL. 10
NO. 2

Ontario Economic Review

March/April 1972

Volume 10, Number 2

The Ontario Economy

Bold and Imaginative British Measures

by Ronald Holloway, *Economist*,
Taxation & Fiscal Policy Branch

Ontario's Property Tax Credit Plan

Taxation and Fiscal Policy Branch,
Department of Treasury and Economics

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. W. Darcy McKeough
*Treasurer of Ontario and
Minister of Economics*

H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

About the Review

The Ontario Government is introducing a property tax credit plan that will relate the property tax burden borne by each taxpayer in Ontario to his particular ability to pay. Commencing with the 1972 taxation year, all individuals and families in Ontario will be able to deduct from their 1972 income tax liability an Ontario tax credit for property taxes paid. The Ontario tax credit will be fully refundable to taxpayers who pay no income tax and to those whose credit entitlement exceeds their personal income tax liability. Ontario's property tax credit plan is estimated to cost the provincial treasury \$160 million in the first year, or modestly more than the former basic shelter grant program. This plan will bring about a substantial redistribution of tax burdens in favour of low-income families and individuals, pensioners and farmers, at the expense of high-income taxpayers. As such, it represents the first step towards coordinated and comprehensive reform of the total federal-provincial-municipal tax burden bearing upon Ontario citizens.

This article, based on Budget Paper B in the 1972 Annual Budget Statement of the Hon. W. Darcy McKeough, was prepared under the direction of Dr. T. M. Russell in the Taxation and Fiscal Policy Branch, Department of Treasury and Economics.

In a short article on the 1972 British Budget, R. G. Holloway outlines recent U.K. measures to stimulate personal consumption and corporate investment.

Indicator Charts, Pages 13-15

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 13-15 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

ONTARIO BUDGET 1972

Continuing economic expansion and a substantial improvement in the unemployment situation remain the crucial issues confronting the Ontario economy. It was with this in mind that Mr. McKeough presented his second budget before Parliament on March 28. He announced a fiscal program aimed at stimulating the private sector and at the same time re-ordering priorities to meet social needs. To achieve this objective the Treasurer introduced a budget containing new spending controls, tax increases and a deficit of \$597 million.

The Treasurer stated that the economy required a fiscal boost combined with reasonable ease in credit conditions. He outlined his stabilization policy as aiming to maintain the province's fiscal policy on a steady course, while avoiding precipitous fiscal actions that would bring about a return to tight credit conditions.

The 1972 budget contains the tightest restraint on provincial spending in 19 years. Total provincial expenditures will increase by only \$216 million or 4.5 per cent in 1972-73. Mr. McKeough stated that tough controls on Ontario's own spending were required "in order to minimize its claim on the economic resources of the Province". Holding increases in direct provincial spending to \$26 million or 2.7 per cent, the provincial government was able to increase its transfer payments to local governments and institutions by \$192 million. Included in the spending plan is \$75 million in new aid to school boards, municipalities and urban transit systems. The Treasurer noted that this will help local authorities contain property taxes in 1972.

Total provincial expenditures are forecast at \$5,051 million, compared with \$4,835 million for the past year. Mr. McKeough laid particular stress on cost control and re-ordering provincial spending priorities:

- Investments in educational facilities will be down by \$53 million;

- Loans for public housing and the environment will be up \$29 million;
- The Province will limit the growth of the Civil Service to about 660 jobs this year — a gain of less than one per cent;
- Fees at universities and community colleges will increase by \$100 per year and new tuition fees will be established at teachers' colleges and schools of nursing;
- Many students will be helped by government loans and grants and the expanded summer program to hire 18,500 students.

Overall financial support to municipalities and school boards will amount to almost \$2 billion in 1972-73. This means that the Ontario Government will finance over 50 per cent of local government expenditures in the coming year.

The severe controls on government spending will leave room for private sector expansion in consumer spending and business investment. Mr. McKeough said he expected gross provincial product to reach nearly \$42 billion in 1972. He forecast an increase of 6.3 per cent in the volume of goods and services produced and price rises of 3.4 per cent.

About 120,000 new jobs will be created in 1972. However, with the Ontario labour force expanding at an "exceptional rate of growth" Mr. McKeough does not envisage a quick end to the problem of unemployment. The unemployment situation is expected to improve steadily and unemployment will drop to an average of 4.8 per cent of the labour force from the average of 5.2 per cent for 1971.

Although tight spending controls have been imposed, the Treasurer still has to raise \$134 million in extra revenues to keep the deficit below \$600 million. He expects to raise the additional revenue by these changes:

- A large case of beer will cost 35 cents more; draft beer will become subject to sales tax; a 25-ounce bottle of liquor will cost an average of 25 to 30 cents more; wine prices will rise an average of 15 to 20 cents per standard bottle;

- The tax on cigarettes goes up by 1.5 cents for a package of 25 cigarettes, and there is a modest increase in the tax on tobacco and cigars;
- The tax on gasoline and motor vehicle fuel is increased by one cent per gallon, and car licence plates will cost \$3 to \$5 more in 1973.

In addition:

- Some people who buy a house may pay a higher land transfer tax;
- A new gift tax is ready for tabling;
- Remuneration to vendors for the collection of taxes will be discontinued;
- Amendments will be made to the Corporations Tax Act to parallel the majority of new federal income tax provisions;
- Some changes will also be made to many departmental fees and licences, including campsite permits, tolls on the two skyways, admission to Ontario Place and the Ontario Science Centre, marriage licences and GO Transit fares.

The Treasurer also announced the introduction of property tax credits to replace the basic shelter grants. The property tax credit will be calculated and claimed when taxpayers file their annual personal income tax forms. Thus, relief against 1972 property taxes will be delivered in the form of income tax refunds in the spring of 1973.

Mr. McKeough heralded the agreement by Ottawa to administer Ontario's tax credit plan as the first real step towards co-ordinated and comprehensive tax reform. He said that Ontario intends to extend its tax credit approach to other taxes as well.

The main objective of the budget, Mr. McKeough asserts, is the expansion of private sector activity and the curbing of inflationary forces as the economy moves back to full performance.

"This expansionary and progressive overall program", the Treasurer said, "stays within the limits of moderation and will help to bring about renewed prosperity and a better life for all Ontario citizens".

Bold and Imaginative British Measures

2

by Ronald Holloway, *Economist*,
Taxation & Fiscal Policy Branch

The British Government has introduced bold and imaginative measures to stimulate both personal consumption and corporate investment at a time when high unemployment is combined with a strong external position, principally by introducing tax cuts which will total £1.2 million in the current financial year. These tax cuts entail a doubling of the projected public sector deficit.

Most of the tax reduction takes the form of the largest-ever increases in personal allowances, with cuts in purchase tax being the most significant of the other changes in terms of immediate revenue loss. The introduction of free depreciation on plant and machinery and increased allowances for industrial buildings will have little effect on revenue for the current year but will represent a major cut in company taxation in future years, estimated at £450 million in 1975-76. Other measures designed to nearly double the rate of economic growth include a new drive for industrial expansion and regional development which could soon rise to an annual cost of up to £1 billion a year. This will include new regional development grants, estimated at £300 million in 1975-76, grants to workers willing to move homes to find satisfactory jobs, tapering shipbuilding grants, accelerated machine tool orders, and new road programs to improve communications between important industrial areas and to provide better access to the ports.

The Chancellor announced last year his intention of reforming corporation tax to remove the discrimination against distributed profits, explaining that this distorts the capital market by impeding companies needing to raise equity capital and so misallocating investment resources as well as lessening the pressure for efficiency. Following the appointment of a select committee, the Chancellor has abandoned his earlier preference for a two-rate system and he has announced his intention of introducing legislation to convert corporation tax to the imputation system. As with the French and Canadian systems, this will provide shareholders with credits for part of the tax paid by a corporation. For most companies trading overseas, relief for overseas tax under the new system will be more favourable than at present and none will be worse off.

A lower rate of tax is to be charged on small companies, defined as those with annual profits of not more than £15,000. On the basis of an illustrative rate of cor-

poration tax of 50 per cent in future years, the rate for small companies will be 40 per cent. Tapering relief will be provided for companies with profits up to £25,000. Many small companies will also benefit from a revision of the close company regulations, particularly from an easing of the distribution shortfall provisions. Further, a fraction of their capital gains will be excluded from charge and the remainder charged to corporation tax at the full rate. The capital gains tax will also be eased for stock options and for trusts.

Company profits will also benefit from increased sales resulting from the lowering of the top rates of purchase tax, charged on the wholesale value of goods. The 45 per cent rate (which applied to luxury items such as jewellery and furs) and the 30 per cent rate (which applied to cars, consumer durables and such items as watches and toys) have both been cut to 25. As a result, it is expected that there will be a reduction of about two-thirds of a point in the cost of living.

This change in rates is partly due to the erosion of the traditional distinction between essential goods and luxuries but it also paves the way towards the adoption of a value-added tax next year, replacing both purchase tax and the selective employment tax. The VAT will have a single rate of 10 per cent, making it the lowest and simplest in the world. As in all other countries with a VAT, there will be exemption for a variety of financial, personal and charitable services. While such exemption will mean that a supplier does not have to charge tax on sales, it also means that tax cannot be reclaimed by the supplier on purchases. This contrasts with the treatment under zero-rating which will be applied to most food items and to housing, domestic fuel and light, fares, books, periodicals and newspapers, and exports. In broad terms, a company which supplies zero-rated goods or services will get complete relief from VAT on both its purchases and its sales. Despite this relief to suppliers, the tax is described as a tax on consumers.

In the field of personal taxation, there are both immediate reliefs and promised reform. Apart from the major increase in allowances, the income limits for age exemption and small income relief have been raised, the starting point for surtax has been raised, and tax relief on interest payments extended from mortgage interest to all forms of interest

payments above £35 (this limit being introduced to provide equity between taxpayers able to secure loans and those with lower credit ratings who have to fall back on hire-purchase agreements).

With surtax already being announced as due for phasing out, new rates of income tax have been announced as operative next year. These provide a basic rate of 30 per cent on the first £5,000. This will be the only rate of tax on most personal incomes. For the next £1,000 the tax rate will be 40 per cent and for incomes above £6,000 the rates will increase in 5 per cent steps to a maximum of 75 per cent on £20,000. There will, however, be a 15 per cent surcharge on investment incomes above £2,000.

Relief has also been applied to death taxes, with generous exemptions from estate duty on property left to spouses and charities, and an increase in the threshold below which no estate duty is payable. A new scale also reduces the burden of estate taxation, a top rate of 75 per cent being reached on property over £500,000.

More radical reforms of personal taxation are under consideration, with a view to simplifying collection and permitting integration with the social security system. The proposals are for a conversion of the pay-you-earn system from a cumulative basis to a non-cumulative, saving 10,000 to 15,000 civil servants, and for the introduction of tax credits in lieu of a complex system of social security payments and rebates. The Chancellor has stated that such a system would provide a fairer and more accurate method of directing help to many people in need and it would tidy up the present borderline between taxation and social benefits. He added that it would provide a smoother graduation from the area of benefit to that of taxation, and so would avoid some of the worst features of what has become known as poverty surtax, with all that that implies by way of disincentives to earn more.

While the adoption of such a scheme must await elaboration in a promised Green Paper and, probably, referral to a select committee, the Government has announced increases in retirement pensions and other social security benefits in the autumn. These increases amount to about 12.5 per cent and, when taken with the increases made last autumn, mean an improvement of about a third. In constant price terms, public spending will increase by 6.5 per cent.

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I INTRODUCTION

Over the past three years, the Government of Ontario has worked towards the goal of incorporating property taxes within the personal income tax system through the mechanism of tax credits. The Ontario government first declared its intention to connect and co-ordinate income taxes and property taxes via a credit scheme in its 1969 white paper on provincial-municipal reform.¹ The basic shelter grants were initiated in 1968 on the recommendation of the Smith Committee as an interim step in this direction. However, the fairest and most effective method of relieving property tax burdens is to relate them to the ability-to-pay principle which governs personal income taxation. Such an integrated system of personal income and property taxation permits systematic redistribution of both tax burdens and achieves comprehensive reform for all taxpayers, including those too poor to pay income tax.

Throughout the long debate on national tax reform, the tax credit approach was consistently advocated by the Ontario government as a superior alternative to a system of increased personal exemptions in the delivery of tax relief.² In its extensive studies and recommendations on reform of the national income tax structure, Ontario demonstrated the conceptual and operational superiority of tax credits over increased personal exemptions in terms of equity to taxpayers, lower revenue cost, simplicity and greater flexibility in response to changing needs over time.³

While rejecting the use of selective income tax credits as a means of achieving tax relief for low-income taxpayers on a national basis, the federal government nevertheless agreed in principle to consider implementing provincial tax credits along the lines favoured by Ontario. Specifically, in discussing the Ontario government's white paper on provincial-municipal tax reform, the federal minister of finance noted:

A third purpose of the Ontario proposal is described as making it possible to permit deductions from the provincial income tax by way of credits for property taxes, retail sales taxes and health insurance premiums. Such credits, it is said, might vary with incomes and family circumstances, and might even involve net payments to those whose credits exceed their provincial income tax liability. The introduction of such tax credits would greatly

complicate the tax return and collection administration. Nevertheless the government would be prepared to discuss the possibility of carrying out such operations under revised collection agreements.⁴

Immediately following the introduction of the new federal income tax legislation (Bill C-259) in June 1971, the Ontario government proceeded to design a simple tax credit system for the benefit of Ontario taxpayers. The system which has been developed is sufficiently flexible to be adapted easily to other provincial taxes, and should prove to be a useful model for other provinces interested in similar reforms.

The major dimensions of Ontario's tax credit plan were outlined to the federal government in November 1971. The Province also requested that it be incorporated in the Canada-Ontario tax collection agreement.⁵ The administrative and operational details of this Ontario tax credit plan were then discussed extensively by Ontario and federal officials and a number of modifications were worked out.⁶ Upon finalization of these details in February 1972, the government of Canada agreed to administer Ontario's property tax credit plan and indicated that it would be used as the standard for other provinces. Commencing with the 1972 taxation year, therefore, this tax credit plan will come into effect and Ontario taxpayers will be able to deduct from their 1972 income tax liability an Ontario tax credit for property taxes paid.

The balance of this paper sets out the full details of the Ontario property tax credit plan, its objectives, design, superiority over present provincial tax relief programs and its impact on representative groups of Ontario taxpayers.

II THE ONTARIO PROPERTY TAX CREDIT

Four aspects of the property tax credit plan will be of prime interest to Ontario taxpayers — its objectives, the amount of the credit, who is eligible to receive it, and how it is to be claimed. The following sections discuss in detail these four aspects of the property tax credit to be legislated by Ontario in 1972.

Objectives

The overriding objective of Ontario's property tax credit plan is to achieve a fairer distribution of the burden of property taxes on individuals and families in Ontario.

Analysis of the incidence of property taxation in Ontario has confirmed that it is regressive over much of the income scale and extremely so for the lowest income groups.⁷ It should be emphasized that this situation is not peculiar to Ontario. President Nixon stated in January of this year that property taxation was "one of the most oppressive and discriminatory of all taxes, hitting most cruelly at the elderly and the retired". Subsequently, he instructed the Advisory Commission on Intergovernmental Relations to review proposals for federal action.⁸

The Ontario basic shelter grants have partially offset this regressivity by providing a flat amount of relief to all taxpayers on the basis of average municipal taxation. However, this program was not adequate either in terms of vertical or horizontal equity. It did not provide sufficient relief to the lowest

¹See Hon. Charles MacNaughton, "Reform of Taxation and Government Structure in Ontario", Ontario Budget 1969 (Toronto: Department of Treasury and Economics, 1969).

²See Hon. W. Darcy McKeough, Ontario Budget 1971 (Toronto: Department of Treasury and Economics, 1971), p. 7.

³See Hon. Charles MacNaughton, Ontario Proposals for Tax Reform in Canada (Toronto: Department of Treasury and Economics, 1970), pp. 15-17; and Staff Paper, Effects of Ontario's Personal Income Tax Proposals, Ontario Studies in Tax Reform 2 (Toronto: Department of Treasury and Economics, 1970), Chapter 4.

⁴Hon. E. J. Benson, Proposals for Tax Reform (Ottawa: Queen's Printer, 1969), p. 83.

⁵See Hon. W. Darcy McKeough, "Preliminary Outline of a System of Property and Sales Tax Credits for Ontario Taxpayers", Meeting of Ministers of Finance, Ottawa, November 1-2, 1971 (Toronto: Department of Treasury and Economics, mimeo.).

⁶Altogether five meetings of officials from the Ontario Department of Treasury and Economics and the Department of National Revenue were held between November 1971 and February 1972 and extensive correspondence was exchanged. A major modification to the original Ontario design was the deletion of the sales tax credit in order to keep the Ontario plan as simple as possible in the first year.

⁷A detailed quantitative study of the incidence of the property tax in a representative Ontario city has been undertaken by the Taxation and Fiscal Policy Branch of the Ontario Treasury. The results of this analysis are summarized in Appendix A. See also the forthcoming Staff Paper, Analysis of Income and Property Taxes in Guelph (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs).

⁸See President Richard M. Nixon, State of the Union Address (Washington: United States Information Service, January 20, 1972), p. 6.

income groups, nor did it provide equal treatment to taxpayers in similar economic circumstances.⁹ The clear thrust of permanent reform, therefore, must be to link property tax burdens directly to the ability to pay of each individual and family in Ontario.

The Ontario government's property tax credit plan aims to achieve this important goal of a more consistent and progressive incidence of property taxation in Ontario. Specifically, it has been designed to meet five objectives:

- To relate the combined burden of income tax and property tax bearing on Ontario residents to their individual ability to pay;
- To reduce the total tax burden on the lowest income families and individuals in Ontario;
- To extend property tax relief to roomers, boarders and others who do not presently benefit from provincial tax relief grants and to eliminate tax relief to non-residents and to taxpayers who can afford to pay;
- To permit better control over the total provincial-municipal tax burden on Ontario taxpayers; and
- To establish a flexible and efficient payout mechanism as the first step towards the eventual replacement of welfare and subsidy programs with a general income support program.

One further objective of Ontario's plan has been to design a tax credit which is simple for taxpayers to understand and calculate on the income tax form, and efficient for government to administer. This dimension of simplicity is important to ensure maximum participation by Ontario taxpayers and the greatest possible improvement in overall equity. The property tax credit system to be introduced in 1972 meets these requirements, yet it is sufficiently flexible in structure to allow significant modification and enrichment in subsequent years.

Amount of the Property Tax Credit

The amount of property tax credit available to any taxpayer will depend on his ability to pay. Ontario's tax credit system will generate credits which vary according to income, family size and the level of property taxes paid. Thus, each taxpayer will be entitled to a property tax credit which is tailored to his particular economic circumstances.

The specific formula for determining the 1972 property tax credit will be as follows:

Homeowners

- \$90 plus 10 per cent of property tax paid minus 1 per cent of taxable income, up to a maximum credit of \$250;

Renters

- \$90 plus 2 per cent of annual rent minus 1 per cent of taxable income, up to a maximum credit of \$250.

Where the property tax paid is less than \$90, or the annual rent is less than \$450, the tax credit entitlement will be equal to the actual property tax paid or 20 per cent of rent paid, minus 1 per cent of taxable income. This is to ensure that a taxpayer who is resident in Ontario for only a few months in the year or who pays a very low property tax or rent is not unduly bonused.

This design of credit ensures a maximum benefit to low-income families and individuals and a smoothly progressive incidence up the income scale. It means that families who are too poor to pay income tax will receive a refund of at least \$100 and in most instances significantly more. It means that middle-income taxpayers will receive tax relief which is roughly equal to the basic shelter grant which they formerly enjoyed. Thus, a family of four having an income of \$10,000 and paying \$400 in property tax would be entitled to a tax credit of \$73, as would a single person earning \$7,600 and paying \$150 a month in rent. It also means that high-income families and individuals will receive no benefit from the property tax credit.

Additionally, this tax credit design ensures that all taxpayers in similar economic circumstances will receive equal treatment. At any particular income level, all families of the same size and paying the same property tax will receive an identical property tax credit. As family size increases, or the level of property tax rises, the value of the tax credit also will increase. In this way, the tax credit mechanism provides a marked improvement in terms of horizontal equity, and redistributes the combined property and income tax burden on a much fairer basis.

Eligibility

In general, all taxpayers who are resident in Ontario on December 31 and who file a personal income tax return will be eligible to claim the Ontario property tax credit. Non-residents who formerly received basic shelter grants will no longer benefit, therefore, from Ontario's tax relief provisions.

Eligible residents will include those who have died during the year and on whose behalf a 'year of death' return is filed. Only three categories of residents will be excluded from claiming a credit under the plan:

- children under 16 years as of December 31;
- persons under 21 years as of December 31 who live at home and are claimed as dependants for income tax purposes; and
- residents of homes for the aged, charitable homes, nursing homes and similar institutions which are exempt from property taxation.

The Ontario property tax credit plan will embrace roomers and boarders as well as families and individuals who rent and homeowners. The credit will apply, however, only to the principal residence of the taxpayer, not to cottages and second homes. In other words, the credit entitlement will be confined to the place of permanent residency of each family or individual. For families that move, of course, all places of permanent residency in Ontario during the year may be included in determining the total property tax or rent paid and the amount of tax credit entitlement. The tax credit plan will achieve a broader coverage than the former basic shelter grants in that roomers and boarders will qualify for tax relief, but at the same time it will be more selective in impact by confining relief to the principal residence only.¹⁰ These changes alone will render Ontario's tax relief efforts far more equitable.

Within this framework of broad eligibility, the tax credit legislation will include a number of definitions and rules to prevent abuses and ensure efficient administration. The most important of these is the rule that, in cases where spouses reside in the same principal residence, the property tax credit must be claimed by the spouse having the highest taxable income. This will avoid the possibility of a substantial tax credit being paid to a family in which one spouse has a high income while the other spouse has a low income. A limited number of other special rules will also apply, including the following:

- Public housing tenants and senior citizen tenants will qualify for the tax credit on the basis of the actual rent they pay;
- The amount of property tax that may be claimed as paid by post-secondary students living in college residences will be

⁹This deficiency in horizontal equity is evident from the fact that the shelter grant paid to any particular taxpayer in 1971 ranged from extremes of \$33 to \$101 depending upon the municipality in which he lived.

¹⁰Under the former basic shelter grant program, tax relief was provided only to separately assessed housing units, which ruled out many roomers and boarders.

limited to \$25, the equivalent of provincial grants-in-lieu of taxes;

- Rent will be defined broadly to include the payment for accommodation including heat, light and parking, but excluding any payment for meals or board.

Claiming the Tax Credit

The Ontario property tax credit will be calculated and claimed when taxpayers file their annual personal income tax return. Thus the 1972 property tax credit will be claimed in the 1972 income tax return and the tax relief will be delivered in the form of an income tax refund in the spring of 1973.¹¹ In co-operation with the Department of National Revenue, the Ontario government will make a special effort to assist those persons who have never filed an income tax return in order to ensure that they get the full benefits to which they are entitled.

The 1972 income tax return to be filed by Ontario taxpayers will include a special form for claiming Ontario's property tax credit. While final details have not yet been worked out with the Department of National Revenue, this separate tax credit form will require only two things of taxpayers:

- a signed declaration of the amount of property tax and/or rent that has been paid in the year; and
- calculation of the amount of tax credit to which the taxpayer is entitled.

Additionally, taxpayers must be prepared to substantiate their declaration of the amount of property tax or rent paid, upon request by the Department of National Revenue. In these instances the taxpayer will be required to produce a receipt showing that he has indeed paid the amount of property tax or rent that he has claimed for the purposes of the tax credit. The Province plans to develop a standard receipt form which will be provided to all households at the end of the year or upon moving, in much the same way that T-4 slips are now provided by employers. In working towards this end, the Ontario government invites the full participation and co-operation both of municipalities and landlords.

It is recognized that problems in the operation of Ontario's tax credit plan will inevitably emerge in the first year. However, given the simplicity of the tax credit design and its advantages to Ontario taxpayers, such difficulties should quickly work them-

selves out. In subsequent years the Ontario property tax credit will become a standard part of the taxpayer's annual tax calculation and an institutionalized element in the income tax collection and refund system. Thus tax reform in Ontario will reach beyond the personal income tax to achieve a fairer distribution of property tax burdens and equal treatment of taxpayers in similar economic circumstances.¹²

III IMPACT OF THE PROPERTY TAX CREDIT ON ONTARIO TAXPAYERS

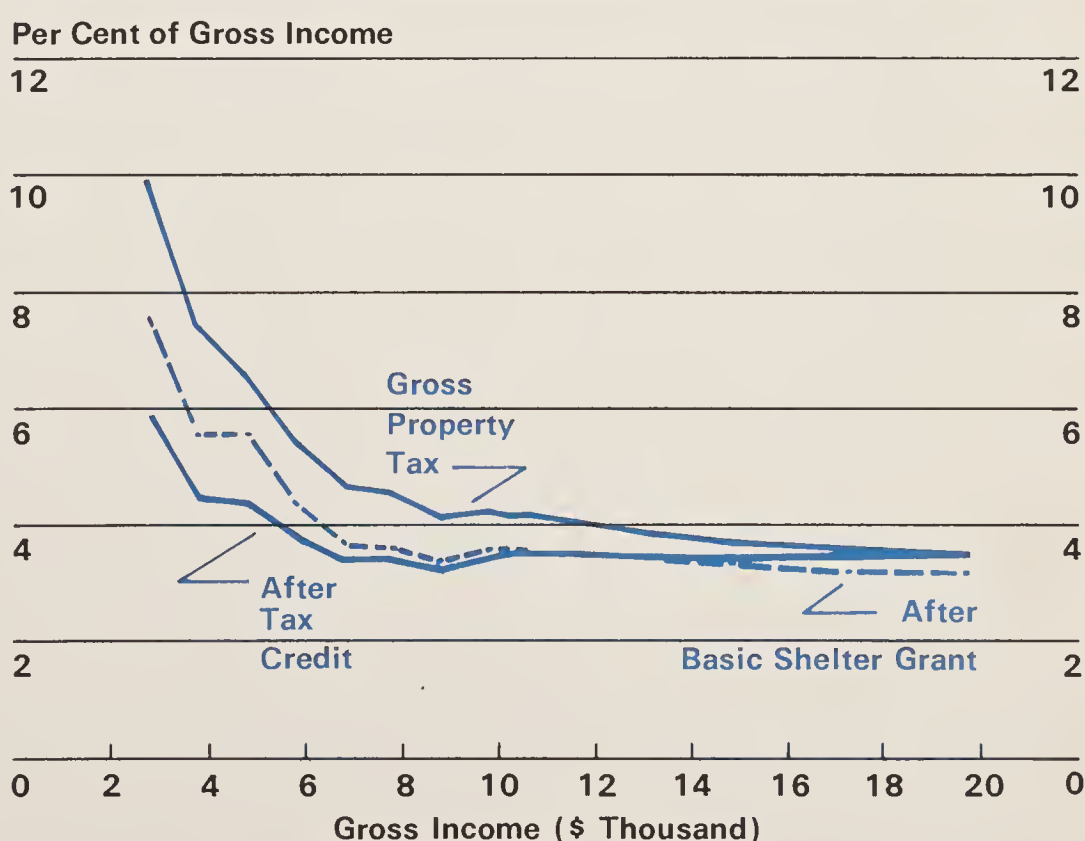
The Ontario government's tax credit will achieve a substantial redistribution of 1972 property tax burdens. It will provide refunds of \$100 or more to all families and individuals who are too poor to pay income tax and it will provide tax relief to roomers and boarders. It will reduce taxes for individuals and families in the lowest brackets of taxable income and for old age pensioners and farmers. The tax burden on middle-income taxpayers will not change appreciably and the tax burden on high-income taxpayers will increase by about \$70, the amount of the former average basic shelter grant. Taxes will also increase for taxpayers who formerly

enjoyed more than one basic shelter grant — such as for a cottage or a second home — whatever their income levels.

The following tables illustrate how the Ontario property tax credit will affect representative taxpaying units at different levels of income and property tax liability. It can be seen that the property tax credit is of maximum value at the bottom end of the income scale and tapers off gradually to zero when income exceeds \$20,000 - \$25,000. The breakeven point at which a typical taxpayer will be no better or no worse off than at present is about \$7,800 for single persons, \$9,400 for couples and \$10,800 for a family with two children.

The progressive impact of the property tax credit is clearly portrayed in Chart 1. This graph shows the value of the tax credit at each income level as a proportion of the gross property tax burden on a representative family. Thus, the tax credit relieves 40 per cent of the gross property tax burden on a family having \$3,000 income versus 20 per cent at \$9,000 income and none of the burden at \$25,000 income. Quite clearly then, linking property taxes to ability to pay produces a fairer and more progressive incidence of the combined burden of property and income taxation in Ontario.

Chart 1—Incidence of Property Taxation on a Representative Family of Four



Source: See Table 1.

¹¹For the 15 per cent of taxpayers whose deductions-at-source or quarterly instalments are less than their final income tax liability for

the year, the property tax credit will take the form of a deduction against the income tax owing.

¹²Parallel suggestions for such a remedy have been made in the United States. See J. Pechman, *Fiscal Federalism for the 1970's* (Washington: The Brookings Institution, 1971).

Table 1 — Impact of Ontario Property Tax Credit (Family With 2 Children Under 16)
(Dollars)

Gross Income	Gross Property Tax	Average Basic Shelter Grant	Property Tax Credit	Change in Tax Relief
3,000	300	70	120	+50
4,000	300	70	119	+49
5,000	330	70	113	+43
6,000	330	70	104	+34
7,000	330	70	94	+24
8,000	360	70	88	+18
9,000	370	70	79	+ 9
10,000	420	70	75	+ 5
12,000	480	70	62	— 8
15,000	555	70	42	—28
20,000	680	70	7	—63
25,000	730	70	0	—70

Table 2 — Impact of Ontario Property Tax Credit (Married Couple)
(Dollars)

Gross Income	Gross Property Tax	Average Basic Shelter Grant	Property Tax Credit	Change in Tax Relief
3,000	300	70	120	+50
4,000	300	70	113	+43
5,000	330	70	107	+37
6,000	330	70	98	+28
7,000	330	70	88	+18
8,000	360	70	82	+12
9,000	370	70	73	+ 3
10,000	420	70	69	— 1
12,000	480	70	56	—14
15,000	555	70	36	—34
20,000	680	70	0	—70
25,000	730	70	0	—70

Notes: 1. The pattern of estimated gross property tax is based schematically on the observed distribution in Guelph as projected to 1972. See Appendix.

2. Taxable income used in calculating the property tax credit is based on the new levels of personal exemptions, \$100 standard deduction, 3 per cent employment expense deduction and a pension contribution equal to 6 per cent of gross income.

3. The formula for determining basic shelter relief was \$30 plus 10 per cent of the average municipal tax burden of the previous year.

IV COMBINED IMPACT OF THE TAX CREDIT AND SUPPLEMENTARY TAX RELIEF PROGRAMS

The Ontario property tax credit plan will replace the basic shelter grant program which has been in force since 1968. Thus, general relief against 1972 property taxes will be delivered in the form of income tax refunds in early 1973 rather than as property tax reductions or rebates in the fall of 1972. In addition, the two other provincial tax relief programs — the 25 per cent farm tax rebates and the \$50 to \$100 supplementary tax relief grants to needy pensioners — will continue intact for 1972.¹³

Needy Pensioners

The new property tax credit plan will provide larger benefits to G.I.S. pensioners than the basic shelter grant program which it replaces. Under the former shelter grant program, needy pensioners who lived in a separately assessed housing unit received about \$70 in tax relief. Under the property tax credit plan, all G.I.S. pensioners will qualify for general property tax relief — including those that are roomers and boarders — and this tax credit relief will amount to at least \$100 because pensioners who qualify for the guaranteed income supplement have no taxable income.

In addition to the property tax credit, G.I.S. pensioners will continue to benefit from Ontario's \$50 to \$100 supplementary tax relief grants. Thus, an eligible pensioner or pensioner couple paying \$210 in property tax will enjoy a complete refund through the combined benefits of the tax credit and supplementary grants. Virtually all needy pensioners in Ontario, therefore, will be sheltered entirely from the regressive burden of property taxation. Table 5 displays the increase in relief to needy pensioners resulting from the combined tax relief programs.

Farmers

The Ontario property tax credit plan also will generate larger benefits to farmers than the former basic shelter grant program. For the many Ontario farmers who have no income tax liability, the tax credit formula will provide general tax relief in excess of \$100, or at least \$30 more than the basic shelter grant. Most farmers who are liable for income taxation will also enjoy large benefits since their taxable income is generally very low. On top of this general tax

¹³Pensioners who qualify for the federal guaranteed income supplement receive from the Ontario Government a supplementary tax relief grant of \$50, plus up to \$50 depending upon the amount of property taxes paid.

relief farmers will continue to enjoy the special 25 per cent farm tax rebate. Thus, almost all farmers in Ontario will benefit in terms of total tax relief as a result of the property tax credit plan. Table 6 illustrates the increase in benefits available to farmers in 1972 and shows that the property tax burden will be removed almost entirely from our poorest farmers.

While the special tax relief programs for pensioners and farmers will be continued in 1972, the Province would prefer to incorporate this supplementary tax relief within its general tax credit system in subsequent years.¹⁴ Apart from the merits of simplicity and efficiency, such a rationalization would permit fairer treatment among all pensioners, by eliminating the sharp cut-off between those who qualify for the guaranteed income supplement and those who do not. The tax credit formula is sufficiently flexible to allow for extra benefits to particular classes of taxpayers, and this is one of its great advantages. After the tax credit system has been in operation for a year and its impact has been fully analyzed, Ontario hopes to be in a position to enrich and modify the basic tax credit formula as a replacement for these existing programs.

FUTURE DIRECTIONS

The introduction of tax credits, fully integrated within the personal income tax collection and refund system, will advance materially the Ontario government's thrust towards comprehensive tax reform. The inclusion of Ontario's property tax credit in the 1972 income tax form will, for the first time, directly link property tax and income tax burdens, relating both to the ability-to-pay principle. This demonstrates that the income tax mechanism can be used as the vehicle for achieving a systematic and more progressive distribution of total tax burdens, not just income tax burdens. The Government of Ontario intends to extend its tax credit approach, therefore, to offset the regressive impact of other taxes as well. In this way, the Province will be able to achieve co-ordinated and comprehensive reform of the total taxes bearing upon Ontario citizens.

Once the property tax credit system is functioning smoothly, Ontario will consider the implementation of a retail sales tax credit. The Province has already explored a number of alternatives towards this end and has outlined one possible retail sales tax

Table 3 — Impact of Ontario Property Tax Credit (Single Person)
(Dollars)

Gross Income	Gross Property Tax	Average Basic Shelter Grant	Property Tax Credit	Change in Tax Relief
3,000	300	70	109	+39
4,000	300	70	100	+30
5,000	330	70	94	+24
6,000	330	70	84	+14
7,000	330	70	75	+ 5
8,000	360	70	68	— 2
9,000	370	70	60	—10
10,000	420	70	56	—14
12,000	480	70	43	—27
15,000	555	70	22	—48
20,000	680	70	0	—70
25,000	730	70	0	—70

- Notes: 1. The pattern of estimated gross property tax is based schematically on the observed distribution in Guelph as projected to 1972. See Appendix.
2. Taxable income used in calculating the property tax credit is based on the new levels of personal exemptions, \$100 standard deduction, 3 per cent employment expense deduction and a pension contribution equal to 6 per cent of gross income.
3. The formula for determining basic shelter relief was \$30 plus 10 per cent of the average municipal tax burden of the previous year.

Table 4 — Impact of Ontario Property Tax Credit (Old Age Pensioner)
(Dollars)

Gross Income	Gross Property Tax	Average Basic Shelter Grant	Property Tax Credit	Change in Tax Relief
2,500	280	70	116	+46
3,000	300	70	113	+43
4,000	300	70	103	+33
5,000	330	70	96	+26
6,000	330	70	86	+16
7,000	330	70	76	+ 6
8,000	360	70	69	— 1
9,000	370	70	60	—10
10,000	420	70	55	—15
15,000	555	70	18	—52
20,000	680	70	0	—70

- Notes: 1. The pattern of estimated gross property tax is based schematically on the observed distribution in Guelph as projected to 1972. See Appendix.
2. Taxable income used in calculating the property tax credit is based on the new level of personal exemption, the \$650 age exemption and the \$100 standard deduction.
3. The formula for determining basic shelter relief was \$30 plus 10 per cent of the average municipal tax burden of the previous year.

¹⁴These special tax relief programs are estimated to cost \$35.3 million in 1972 — \$16.3 million in farm tax rebates and \$19.0 million in supplementary tax relief to needy pensioners.

Table 5 — Tax Relief to G.I.S. Pensioners
(Dollars)

Gross Property Tax	Former Tax Relief			1972 Tax Relief		
	Basic Shelter Grant	Total Supplementary Assistance	Total	Property Tax Credit	Total Supplementary Assistance	Total
150	70	80	150	105	100	205
200	70	100	170	110	100	210
250	70	100	170	115	100	215
300	70	100	170	120	100	220
350	70	100	170	125	100	225
400	70	100	170	130	100	230

- Notes: 1. Some 300,000 Ontario residents 65 years of age or older receive a guaranteed income supplement (G.I.S.) in addition to the old age pension. Single pensioners qualify for G.I.S. if their private income is below \$1,392 while pensioner couples qualify if their private income is below \$2,448.
2. Ontario's supplementary assistance was a flat \$50 to all G.I.S. pensioners and up to a further \$50 depending upon net property taxes paid after deduction of basic shelter relief. In 1972 the additional \$50 may be claimed by a single pensioner up to the limit of his gross property tax levy.
3. The formula for determining the value of basic shelter relief was \$30 plus 10 per cent of average municipal taxes of the previous year.

Table 6 — Tax Relief to Farmers
(Dollars)

Gross Property Tax	Former Tax Relief			1972 Tax Relief		
	Basic Shelter Grant	25% Rebate	Total	Property Tax Credit	25% Rebate	Total
150	70	20	90	105	37	142
200	70	32	102	110	50	160
300	70	58	128	120	75	195
400	70	82	152	130	100	230
500	70	108	178	140	125	265
600	70	132	202	150	150	300
700	70	158	228	160	175	335
1,000	70	232	302	190	250	440

- Notes: 1. This table shows the tax relief provided to farmers who have no taxable income. For farmers whose income is sufficiently high to be liable for income tax, the property tax credit would be reduced accordingly. In 1969, some 38,000 Ontario farmers were liable for income taxation and their average rate of tax was about 13 per cent.
2. In 1972 the 25 per cent farm tax rebate relates to the gross property tax paid by the farmer. While the basic shelter program was in force, the 25 per cent rebate was based on the net property tax after deduction of the basic shelter grant.
3. The formula for determining the value of basic shelter relief was \$30 plus 10 per cent of average municipal taxes of the previous year.

formula which would be simple yet effective.¹⁵ This potential design would provide a sales tax credit of \$10 to the taxfiler plus \$10 for each dependant, minus 1 per cent of taxable income. Like the property tax credit, this structure produces maximum benefit to low-income families and gradually tapering relief up the income scale. Thus, along with the existing exemption on food and necessities, such a tax credit would completely shelter our lowest-income families from the burden of the retail sales tax. Ontario is also exploring the possibility of other tax credits to replace health premium assistance and low-income housing subsidies. By means of such tax credits, the total burden of taxes can be lifted from our poorest families and individuals, thereby making real progress towards ensuring them a more decent standard of living.

Equally important, the acceptance of Ontario's tax credit plan by the Government of Canada represents a positive step towards developing a guaranteed income plan for all Canadians. The property tax credit plan will provide valuable experience in using the income tax system as a refund or pay-out mechanism. It will generate much needed information about people who are too poor to pay income tax and will reward them for filing an income tax form. It will offer a realistic approach towards supplementing the income of our working poor. Eventually, it may be adapted as the basic mechanism for underpinning the income of all Canadians and replacing the present myriad of welfare schemes.

¹⁵See Hon. W. Darcy McKeough, "Preliminary Outline of a System of Property and Sales Tax Credits for Ontario Taxpayers", op. cit.

THE INCIDENCE OF PROPERTY TAXATION IN AN ONTARIO TEST LOCALITY

Introduction

Designing a property tax credit scheme, it is critical to identify the relationship between property tax burdens and income. A number of studies have attempted to measure the incidence of taxes levied upon property values.¹ In general, these studies have concluded that the property tax is regressive over most of the income scale. However, the data limitations of these previous studies, and the fact that they related to other jurisdictions meant that they were of limited value for purposes of policy formulation by the Ontario government. In view of this, the Ontario Treasury undertook a detailed and comprehensive study of the incidence of property taxation by income level in a test location in Ontario. This Ontario study is essentially a quantitative computer analysis, which matches the income and property taxes of over 11,000 taxfilers in Guelph. A forthcoming staff study will provide a full report on the methods and findings of the analysis. This appendix summarizes the principal results available to date.²

Guelph in Perspective

Guelph was used as a test location primarily because property tax information in a readily analyzable form was available for that municipality. This raises the question of whether Guelph, as the test locality, is more or less typical of the situation for Ontario as a

whole or whether it is in some respects a special case. Using the following criteria as a basis for comparison, it can be seen that Guelph is indeed reasonably representative of Ontario as a whole and, therefore, a useful basis from which overall conclusions can be drawn.

Results of the Analysis

A computer model was designed for the specific purpose of testing tax credit schemes against the Guelph data base. The model matches over 11,000 income tax records against property tax records, in order to measure the incidence of property tax by income level and to simulate the revenue and incidence impact of alternative tax credit designs. The base year for both the income tax and property tax data was 1968. Results for 1968 were extrapolated to 1972 on the basis of the observed experience in Guelph from 1969 to 1971 in the case of the property tax, and on the basis of province-wide experience in the case of income.

The Guelph analysis confirms that the property tax is significantly regressive. The findings show that property taxes pre-empt a high proportion of gross income for persons earning below \$3,000, and a decreasing proportion for incomes between \$3,000 and \$6,000. On incomes between \$6,000 and \$12,000 the property tax verges on proportionality, then resumes its regressive pattern above the \$12,000 income range. The regressive burden of the property tax is particularly apparent for two sub-groups of taxpayers — the elderly and young families.

These groups exhibit an average property tax burden very close to that of the total population, yet their incomes are significantly below the average for the population as a whole. Table A-1 displays these relationships between the property tax burden and income levels.

The computer model was also used to compare the impact of Ontario's property tax credit plan versus the former basic shelter grant program.³ Table A-2 shows that the tax credit plan generates a progressive pattern of tax relief in contrast to the basic shelter grant which provided a flat relief payment to all taxpayers. The cost of the property tax credit plan was also estimated for the Guelph sample of taxpayers and was found to be modestly higher than the cost of continuing the basic shelter grant program.

¹See Dick Netzer, *Economics of the Property Tax, Studies in Government Finance* (Washington: The Brookings Institution, 1966); Margaret Reid, *Housing and Income* (Chicago: University of Chicago Press, 1962); Report of the Committee of Inquiry into the Impact of Rates on Households (London: H.M.S.O., 1965); and A. R. Ilersic, *Allen and After* (London: The Rating and Valuation Association, 1965).

²See *Staff Study, Analysis of Income and Property Taxes in Guelph* (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, forthcoming).

³The property tax credit formula is \$90 plus 10 per cent of property taxes paid minus 1 per cent of taxable income, up to a maximum credit of \$250.

	1969	
	Guelph	Ontario
Average gross income per taxfiler	\$5,348	\$5,622
Average residential property tax	\$347	\$371
Ratio of residential to total taxable assessment	.609	.604
Ratio of exempt assessment to total assessment	.383 ¹	.216

Source: 1969 Summary of Financial Reports of Municipalities, Vol. I (Toronto: Department of Municipal Affairs, 1970) and, Taxation Statistics (Ottawa: Department of National Revenue, Taxation, 1971).

¹The high ratio of exempt to total assessment reflects the extensive university and penal reform properties in Guelph.

Table A-1 — Summary of Guelph Results
(Dollars)

Gross Income Class	Actual 1968	Projection for 1972		
	Average Gross Property Tax	Average Tax as Percentage of Gross Income	Average Gross Property Tax	Average Tax as Percentage of Gross Income
3,000 - 3,500	290	9	334	10
3,500 - 4,000	306	8	329	9
4,000 - 4,500	308	7	330	8
4,500 - 5,000	303	6	335	7
5,000 - 5,500	297	6	343	7
5,500 - 6,000	297	5	333	6
6,000 - 6,500	306	5	328	5
6,500 - 7,000	323	5	329	5
7,000 - 7,500	333	5	331	5
7,500 - 8,000	335	4	348	4
8,000 - 8,500	353	4	357	4
8,500 - 9,000	373	4	374	4
9,000 - 9,500	379	4	372	4
9,500 - 10,000	409	4	378	4
10,000 - 12,000	435	4	416	4
12,000 - 15,000	496	4	484	4
15,000 - 20,000	579	3	555	3
20,000 - 25,000	632	3	679	3
25,000 - 50,000	690	2	729	2

Source: Computer analysis of income tax and property tax records for residents of Guelph.

Note: 1968 is the base year for the computer analysis. Projections for 1972 are made assuming that incomes rise as forecast by the Ontario Treasury and property tax burdens increase in line with the actual experience in Guelph from 1968 to 1971 and a trend projection for 1972.

Table A-2 – Summary of Guelph Results (Projection for 1972)
(Dollars)

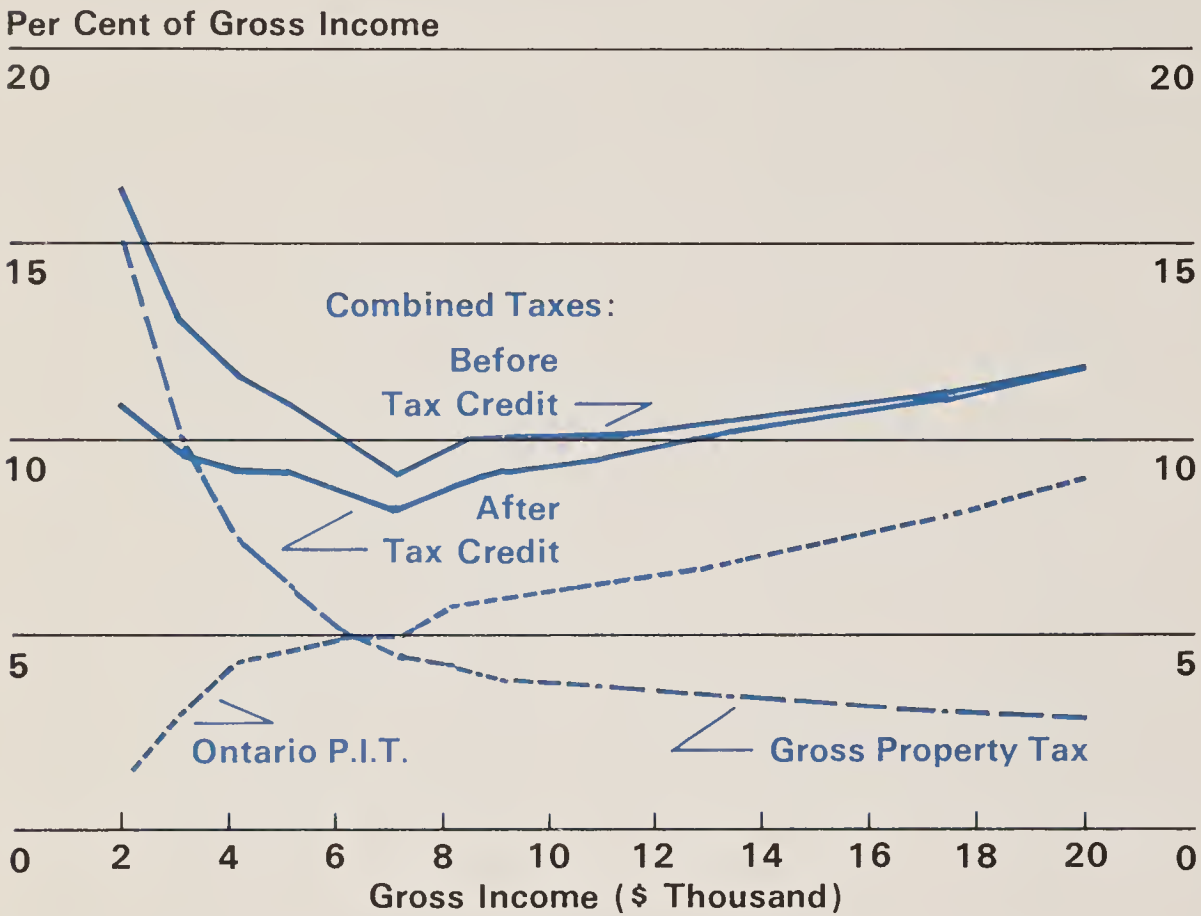
Gross Income Class	Average Gross Property Tax	Basic Shelter Grant	Average Property Tax Credit	Change in Relief
3,000 - 3,500	334	66	114	+48
3,500 - 4,000	329	66	109	+43
4,000 - 4,500	330	66	103	+37
4,500 - 5,000	335	66	99	+33
5,000 - 5,500	343	66	96	+30
5,500 - 6,000	333	66	91	+25
6,000 - 6,500	328	66	86	+20
6,500 - 7,000	329	66	81	+15
7,000 - 7,500	331	66	77	+11
7,500 - 8,000	348	66	74	+ 8
8,000 - 8,500	357	66	72	+ 6
8,500 - 9,000	374	66	68	+ 2
9,000 - 9,500	372	66	63	— 3
9,500 - 10,000	378	66	57	— 9
10,000 - 12,000	416	66	52	—14
12,000 - 15,000	484	66	35	—31
15,000 - 20,000	555	66	13	—53
20,000 - 25,000	679	66	3	—63
25,000 - 50,000	729	66	0	—66

Source: Computer analysis of income tax and property tax records for residents of Guelph.

Notes: 1. The analysis is undertaken assuming Bill C-259 to have been in effect in both 1968 and 1972.

2. For purposes of comparison it is assumed that the basic shelter grant formula applies in 1972 and average property tax levies in Guelph increase in line with the actual experience in Guelph from 1968 to 1971 and a trend projection for 1972.

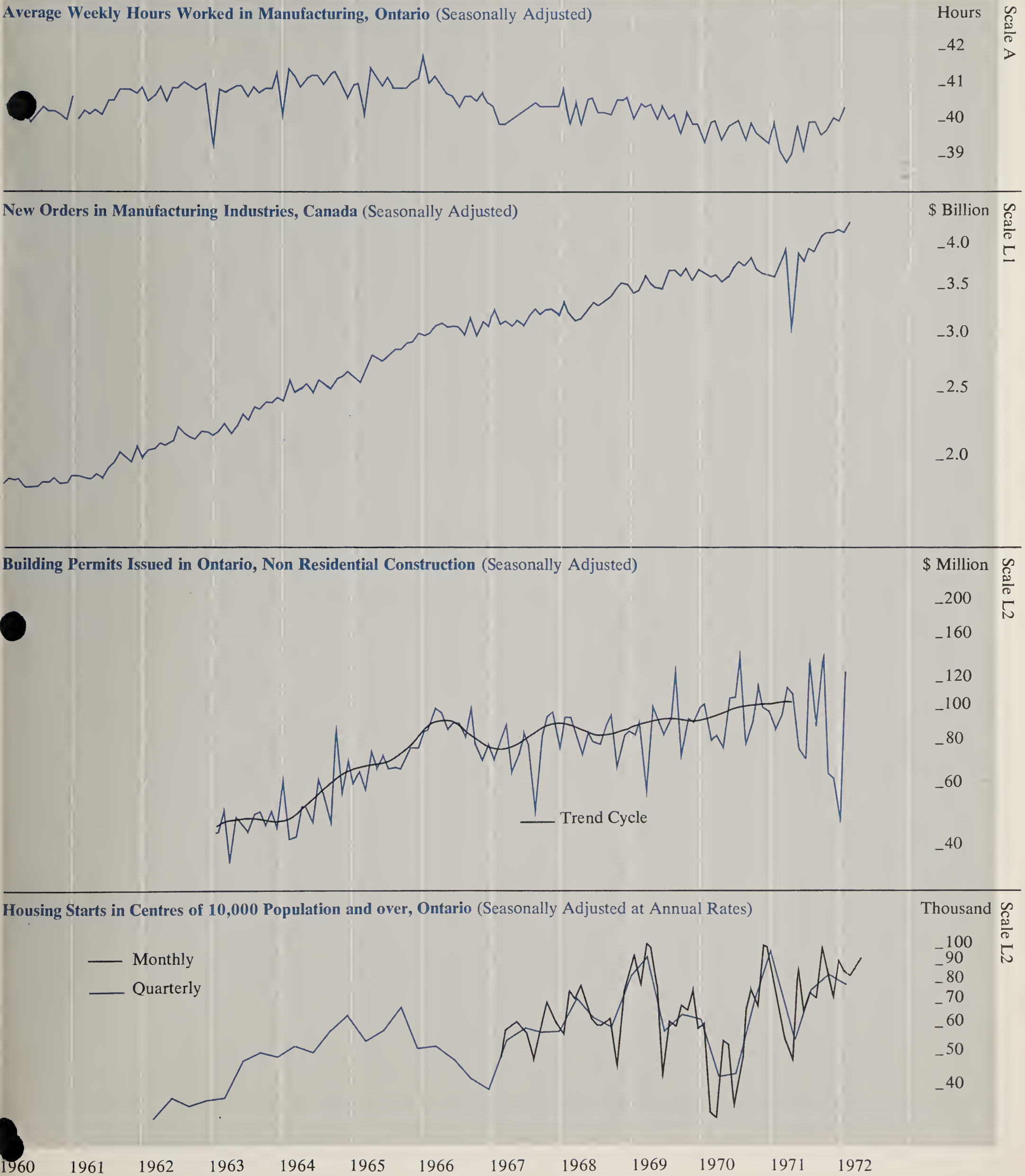
Chart A-1—Incidence of Property and Income Taxes in Guelph, as Projected to 1972



Source: Computer analysis of matched income and assessment roll records for residents of Guelph.

Selected Economic Indicators

Leading Indicators



Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion

Scale L1

_35

_30

_25

_20

_15

Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index

Scale L2

_200

_180

_160

_140

_120

_100

Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion

Scale L1

_90

_80

_70

_60

_50

_40

_35

new series
constant (1961) dollars

— Current Dollars

— Constant (1957) Dollars

Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

Dollars

Scale L1

_3.50

_3.00

_2.50

_2.00

1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent
Scale A
_8.0
_7.0
_6.0
_5.0
_4.0
_3.0
_2.0



Employment, Ontario (Seasonally Adjusted)

Million
Scale L1
_3.25
_3.00
_2.75
_2.50
_2.25



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)

Per Cent
Scale A
_2.0
_3.0
_4.0
_5.0
_6.0



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index
Scale L2
_400
_300
_200
_100
_70
_50



1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

Economic Indicators

Seasonally Adjusted

1971

1972

Leading Indicators

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Average Weekly Hours Worked in Manufacturing	39.2	39.5	39.9	39.8	39.2	40.0	39.8	39.8	39.8	40.0	40.0	40.4		
New Orders in Manufacturing Industries ^c	3,846.0	4,084.8	4,100.2	4,045.6	3,981.3	4,130.2	3,993.7	4,267.3	4,334.7	4,216.9	4,267.0	4,216.1	4,370.4	
Building Permits Issued in Ontario, Non-Residential Construction	97.0	117.5	112.0	77.1	74.9	139.8	92.6	146.2	67.3	64.6	48.4	128.3		
Urban Housing Starts (Annual Rate)	65,800	64,100	48,400	88,000	67,900	75,000	73,000	99,400	82,900	73,600	98,500	77,500	82,900	123,100
Money Supply ^c	32,083	32,540	33,131	33,526	34,281	34,686	35,009	35,456	35,978	36,406	36,964	37,423	38,281	38,671
T.S.E. Industrial Index ^u	178.1	177.4	185.3	181.6	177.8	180.7	177.5	176.3	169.9	160.8	166.2	181.6	197.3	203.6
Business Failures ^u	71	70	100	81	88	66	60	55	40	78	94	61	44	61
Business Failures — Liabilities ^u	11.6	4.5	5.2	3.8	3.4	5.3	8.0	5.3	2.1	5.6	5.7	3.7	3.4	4.7

Coincidental and Lagging Indicators

Gross National Product ^c (Annual Rate)	\$ Million	88,432	91,156	93,344	95,572									
Average Hourly Earnings in Manufacturing	Dollars	3.37	3.43	3.42	3.44	3.46	3.48	3.46	3.47	3.49	3.51	3.52	3.53	
3-Month Treasury Bill Rate ^u	Per Cent	4.68	4.06	3.16	3.00	3.03	3.37	3.68	3.79	4.06	3.47	3.24	3.21	3.36
Cheques Cashed in Clearing Centres ¹	\$ Million	6,589	7,200	7,956	7,519	7,062	7,110	7,457	7,843	7,988	8,291	8,248	8,098	7,627
Retail Trade	\$ Million	900	941	947	995	992	989	983	972	1,000	1,001	1,030	1,003	1,031
Labour Force	000's	3,226	3,233	3,214	3,216	3,222	3,229	3,233	3,234	3,269	3,287	3,309	3,320	3,359
Employed	000's	3,041	3,048	3,041	3,029	3,050	3,060	3,081	3,080	3,106	3,118	3,136	3,159	3,197
Unemployed	000's	172	169	162	180	171	164	150	164	179	186	185	165	162
Unemployed as % of Labour Force	Per Cent	5.4	5.3	5.1	5.6	5.3	5.1	4.6	5.1	5.4	5.6	5.6	5.0	4.8
Wages and Salaries	\$ Million	1,640	1,669	1,685	1,707	1,742	1,754	1,744	1,763	1,775	1,771	1,782	1,786	
Index of Industrial Employment	1961 = 100	130.9	131.0	131.4	132.3	133.1	133.8	132.6	132.2	132.8	132.3	130.6	130.8	130.5

Index of Industrial Production ^c	1961 = 100	174.0	173.5	174.5	173.6	174.7	175.5	176.2	179.5	180.5	181.9	181.7	183.3	183.9
Total Manufacturing ^c		170.0	169.7	170.5	170.2	171.2	171.8	171.9	175.1	176.1	178.7	176.8	178.0	178.8
Non-Durables ^c		154.5	150.4	152.6	152.6	154.1	154.6	154.6	156.3	156.8	159.1	158.2	159.5	160.1
Durables ^c		189.5	194.2	193.1	192.5	192.8	193.5	193.7	198.9	200.5	203.5	200.2	201.4	204.1
Mining ^c		178.3	175.5	178.0	175.2	179.3	180.7	184.0	184.4	185.6	183.0	188.6	191.6	187.8
Electric Power and Gas Utilities ^c		202.4	202.3	203.9	200.2	197.4	198.8	201.1	208.9	210.6	207.9	212.7	215.4	214.8
Primary Energy Demand (Annual Rate)	BKWH	67.62	67.76	68.14	67.21	65.74	67.86	67.33	69.82	71.13	68.06	70.26	68.83	70.19
Exports (including re-exports) ^c	\$ Million	1,439	1,391	1,503	1,395	1,464	1,550	1,446	1,516	1,522	1,545	1,516	1,495	1,462
Imports ^c	\$ Million	1,128	1,181	1,339	1,181	1,279	1,343	1,321	1,387	1,284	1,467	1,359	1,345	1,473

Unclassified Indicators

Foreign Exchange Reserves ^{c,u}	U.S. \$ Million	3,816	3,868	3,944	3,962	3,998	3,977	4,056	4,319	4,308	4,379	4,573	4,852	4,838
Industrial Materials Price Index ^{c,u}	1935-39 = 100	264.2	266.0	266.4	267.6	267.1	267.4	266.6	267.4	267.1	266.9	268.5	2,698	277.1
Consumer Price Index ^{c,u}	1961 = 100	130.3	130.9	131.3	132.2	132.7	133.0	134.1	135.0	134.7	134.9	135.4	136.3	136.7
Toronto ^u		126.7	127.2	127.7	128.3	129.2	129.5	130.2	130.6	130.7	130.2	130.5	131.6	132.0
Ottawa ^u		127.5	128.3	129.0	129.7	130.5	130.9	131.8	132.0	131.7	131.6	132.3	133.0	133.6
Thunder Bay ^u		102.0	102.3	102.6	103.0	103.5	103.7	104.2	104.6	105.2	104.8	104.9	105.4	105.8
Purchasing Power of 1961 Consumer Dollar ^{c,u}	1969 = 100	0.77	0.76	0.76	0.76	0.75	0.75	0.75	0.74	0.74	0.74	0.74	0.73	0.73

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.



REFERENCE COPY



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Hon. W. Darcy McKeough, Treasurer of Ontario
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H. Ian Macdonald, Deputy Minister

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H. Ian Macdonald
Deputy Minister

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Sectoral Characteristics of the Ontario Structure of Production

A. A. Kubursi and R. H. Frank*

I INTRODUCTION

National income statistics such as those on "Gross National Product", "Disposable Income", and "Personal Consumption Expenditures" have often been used to describe the working of the economic system. Recently, however, economists have found it necessary to penetrate below the surface of global statistics, and to examine the structural interdependence of the system.¹

It is now generally recognized that each economic system has a complicated internal structure that determines its performance, and that the study of this internal structure has become indispensable to the proper understanding and control of the economy. This is perhaps why, over the past few decades, the internal economic framework of a large number of countries and regions has been described by a technique known as "input-output" analysis.

The basic tool of this body of analysis is an "inter-industry" table which consists of a set of linear formulae connecting the levels of activity of the various sectors of an economy.² Each sector is considered to buy its inputs from other sectors and to sell its outputs to other sectors, and in the "open" version of the system, to an "autonomous sector" which has no output of its own. The "autonomous sector", if there is one, represents final demand and is unexplained within the model. The major advantage of this table is that it reveals the indirect relationships of an economic system and facilitates the economic justification and interpretation of these indirect relationships and their consequences by input-output analysis.

This paper is an attempt to use the input-output system of Ontario³ as a basis for a detailed analysis of some of the economic and technical implications of sectoral interdependencies in the Ontario economy. In particular we shall examine and determine the implications of the following:

- 1) the nature and extent of indirect and induced links among the various sectors of the economy;
- 2) the various primary and induced income and employment multipliers of each sector;
- 3) the different types of productive sectors classified according to their input uses and output distribution;
- 4) the nature and extent of backward linkages among sectors;

- 5) the nature and extent of forward linkages among sectors;
- 6) the determination of measures of dispersion of the various coefficients of linkages;
- 7) the identification of "key" sectors of Ontario's economy;
- 8) the nature and extent of dependence of the various sectors on the various categories of final demand, and
- 9) the construction of an overall index of performance for each sector of production.

The general plan of this paper is to consider each of these topics separately. We shall start with the question of determining the direct, indirect and induced output effects of each sector in response to a dollar change in the final demand of any sector j .⁴

II THE NATURE AND STRENGTH OF INDIRECT AND INDUCED SECTORAL LINKS

The technical input-output matrix reveals the direct connection of an industry with others. However, an industry may directly sell to or buy from only a few industries, but its customers and suppliers may be connected with many industries. This industry may thus have a profound influence on the economy through its indirect relations with other industries. Therefore, it is essential that one considers all direct and indirect relations that a given industry has with all other industries.

To evaluate the direct and indirect relations an industry has with other industries, we have to evaluate the "matrix multiplier" $(\mathbf{I} - \mathbf{A})^{-1}$. This is so since the gross output levels \mathbf{x} 's required to sustain a given vector of final demand \mathbf{f} in the open model is determined by the following equation system:

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{f} \quad (1)$$

If the inverse of the $(\mathbf{I} - \mathbf{A})$ matrix exists, it may be expressed by means of the binomial expansion:⁵

$$\begin{aligned} (\mathbf{I} - \mathbf{A})^{-1} &= \mathbf{I}^{-1} + (-1) \mathbf{I}^{-2} (-\mathbf{A}) + \\ &\quad \frac{(-1)(-2)}{2!} \mathbf{I}^{-3} (-\mathbf{A})^2 + \quad (2) \\ &\quad \frac{(-1)(-2)(-3)}{3!} \mathbf{I}^{-4} (-\mathbf{A})^3 + \dots \end{aligned}$$

$$\begin{aligned} &= \mathbf{I} + \mathbf{I}\mathbf{A} + \mathbf{I}\mathbf{A}^2 + \mathbf{I}\mathbf{A}^3 + \dots \\ &= \mathbf{I} + \mathbf{A} + \mathbf{A}^2 + \mathbf{A}^3 + \mathbf{A}^4 + \dots \\ &= \sum_{k=0}^{\infty} \mathbf{A}^k \end{aligned}$$

The inverse matrix, $(\mathbf{I} - \mathbf{A})^{-1}$, indicates the total direct plus indirect output required per unit of final demand. The series in (2) simply explains the general composition of this total output requirement. The first term, \mathbf{I} , accounts for the one unit of output to be delivered to final demand. The second term, \mathbf{A} , indicates the direct input required to produce this unit of final demand. The next term, \mathbf{A}^2 , indicates first-round indirect inputs required to produce the direct input \mathbf{A} , etc.⁶ Due to the fact that the elements of the \mathbf{A} matrix satisfy the Hawkins-Simon condition, $a_{ij}^{(k)}$ decreases as k increases and the $(\mathbf{I} - \mathbf{A})^{-1}$ is approximated by the sum of the powers of \mathbf{A} .

If we represent the elements of the $(\mathbf{I} - \mathbf{A})^{-1}$ matrix by c_{ij} 's, the sum of the column elements of the $(\mathbf{I} - \mathbf{A})^{-1}$

¹W. W. Leontief, *Input-Output Economics* (Oxford: Oxford University Press, 1966).

²Robert Dorfman, "The Nature and Significance of Input-Output", *Review of Economics and Statistics*, (May, 1954).

³R. H. Frank, S. M. Batrik and D. Haronitis, "The Input-Output Structure of the Ontario Economy", *Ontario Economic Review*, (Jan./Feb. 1970).

⁴It is generally assumed throughout the paper that the reader is familiar with the basic techniques of input-output analysis. Introduction to Input-Output Economics (New York: Holt, Rinehart and Winston, 1969) by Chiou-Shang Yan provides an elementary exposition of this subject.

⁵The system $\sum_{k=0}^{\infty} \mathbf{A}^k = (\mathbf{I} - \mathbf{A})^{-1}$ is not true

for any arbitrary \mathbf{A} , but it holds when \mathbf{A} satisfies the following conditions:

(1) $0 \leq a_{ij} < 1$ for all (i, j) ,

(2) $\sum_{i=1}^n a_{ij} < 1$ for all j .

These two conditions are generally known as the Hawkins-Simon Condition. For further details see, D. Hawkins and H. A. Simon, "Note: Some Conditions of Macroeconomic Stability", *Econometrica*, (July - October, 1949).

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*The authors are, respectively, Assistant Professor of Economics, McMaster University and consultant to the Economic Analysis Branch, and Director, Economic Analysis

Branch, Economic and Statistical Services Division, Department of Treasury and Economics. The authors wish to acknowledge the editorial assistance of Mr. John Morning

$$\sum_{i=1}^n c_{ij} = c_{.j} \quad (3)$$

indicates the total input requirements (direct plus indirect) for a unit increase in the final demand for industry j . This is so since from (1) we have,

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{f}$$

If we replace the vector \mathbf{f} in (1) by another column vector \mathbf{e} whose entries are all zeros except in the j^{th} position where we have one, we obtain:

$$\begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix} = \begin{bmatrix} c_{11} & \dots & c_{1n} \\ \vdots & \ddots & \vdots \\ c_{n1} & \dots & c_{nn} \end{bmatrix} \begin{bmatrix} 0 \\ 0 \\ \vdots \\ 1 \\ \vdots \\ 0 \end{bmatrix} = \begin{bmatrix} c_{1j} \\ \vdots \\ c_{nj} \end{bmatrix} \quad (4)$$

The total output effect in (3) is obviously the sum of the column vector $(c_{1j}, c_{2j}, \dots, c_{nj})$ in (4). This total output effect of a dollar increase in the final demand in sector j takes into account only the repercussions of the initial change in the final demand for that sector. But the repercussions of the initial unit change in sector j 's final demand do not terminate here. In fact there is additional income generated in the process of producing an extra dollar of output j and this is bound to induce more consumption and consequently more production.

To evaluate the overall output effect (direct plus indirect plus induced) within the input-output framework we have to relate consumption to value added in such a way that consumption may be considered as

the "input" necessary to produce the "output" of income. In other words we have to treat households as a production sector.

Let us define a new matrix \mathbf{B} such that:

$$\mathbf{B} = \begin{bmatrix} \mathbf{A} & \mathbf{c}^* \\ \mathbf{h} & \mathbf{o} \end{bmatrix} \quad (5)$$

where \mathbf{h} represents a row vector of value added per unit of output in each sector;

\mathbf{c}^* is a column vector of average propensity to consume per industry, the typical $c_i^* = \frac{c_i}{\eta}$ where η is total income and c_i is consumption from industry i ;

\mathbf{A} is the technical coefficient matrix. The input-output system will now appear as:

$$(\mathbf{I} - \mathbf{B}) \mathbf{x}^* = \mathbf{f}^* \quad (6)$$

where $\mathbf{x}^* = \begin{bmatrix} \mathbf{x} \\ \eta \end{bmatrix}$ and $\mathbf{f}^* = \begin{bmatrix} \mathbf{f}^a \\ \mathbf{o} \end{bmatrix}$ where \mathbf{f}^a is \mathbf{f}

exclusive of consumption.

In a less compact form (6) appears as follows:

$$\begin{bmatrix} \mathbf{I} - \mathbf{A} & -\mathbf{c}^* \\ -\mathbf{h} & \mathbf{1} \end{bmatrix} \begin{bmatrix} \mathbf{x} \\ \eta \end{bmatrix} = \begin{bmatrix} \mathbf{f}^a \\ \mathbf{o} \end{bmatrix} \quad (7)$$

The solution of this system, if it exists, is represented by (8):

$$\begin{bmatrix} \mathbf{x} \\ \eta \end{bmatrix} = \begin{bmatrix} \mathbf{I} - \mathbf{A} & -\mathbf{c}^* \\ -\mathbf{h} & \mathbf{1} \end{bmatrix}^{-1} \begin{bmatrix} \mathbf{f}^a \\ \mathbf{o} \end{bmatrix} \quad (8)$$

If we denote the elements of the $(\mathbf{I} - \mathbf{B})^{-1}$ matrix by b_{ij} 's, the sum of the column elements:

$$\sum_{i=1}^n b_{ij} = b_{.j} \quad \text{for all } j = 1, \dots, n \quad (9)$$

indicates the total direct plus indirect plus induced output effects per dollar increase in the final demand of the j^{th} industry. It is interesting to note that the last row of the $(\mathbf{I} - \mathbf{B})^{-1}$ matrix represents the "output" households must produce per dollar of final demand of each industry. Since the "output" of households is exactly the income earned by households, the last row in fact indicates the total income generated from one dollar of final demand of each industry. It includes not only the direct and indirect income effects but also the induced income effects. This follows from the fact that we included households in the production sectors which enables us to take into account increases in consumption due to increases in income.

To separate the total induced output effects per dollar increase in the final demand of, say, industry j , we have to subtract equation (3) from (9). Let

$$Y_j = b_{.j} - c_{.j} = \sum_{i=1}^n (b_{ij} - c_{ij}) \quad \text{for all } j = 1, \dots, n. \quad (10)$$

Similarly, the total indirect output effects per dollar increase in the final demand of the j^{th} industry may be written as:

$$\Phi_j = (c_{.j} - a_{.j}) = \sum_{i=1}^n (c_{ij} - a_{ij}) \quad \text{for all } j = 1, \dots, n. \quad (11)$$

The total direct output effects per dollar increase in the final demand of the j^{th} industry are then:

$$\beta_j = a_{.j} = \sum_{i=1}^n a_{ij} \quad \text{for all } j = 1, \dots, n. \quad (12)$$

where a_{ij} is the amount of resource i needed to produce one dollar's worth of output j .

The Y_j , Φ_j and β_j are represented for each sector j in Table 1 and their relative magnitudes are visualized in Chart 1.

From Table 1 and Chart 1 we are able to see that a dollar increase in the final demand of sector (3), (Meat and Poultry), results in the largest total direct plus indirect plus induced output effect. Next in magnitude is sector (8), (Other Food Industries) followed by sector (4), (Dairy Products).⁷

It is interesting to note that the three largest total output effects are produced by increases in the final demand of the set of "food" producing sectors. On the other hand,

⁶Let us illustrate this by a hypothetical n -sectors example.

$$\text{Let } A^2 = \begin{bmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \dots & a_{nn} \end{bmatrix} \begin{bmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \dots & a_{nn} \end{bmatrix} = \begin{bmatrix} \sum_{k=1}^n a_{1k}a_{k1} & \dots & \sum_{k=1}^n a_{1k}a_{kn} \\ \vdots & \ddots & \vdots \\ \sum_{k=1}^n a_{nk}a_{k1} & \dots & \sum_{k=1}^n a_{nk}a_{kn} \end{bmatrix}$$

If we denote the $(i, j)^{\text{th}}$ element of A^2 by $a_{ij}^{(2)}$, it is then true that the element $a_{ij}^{(2)}$ is the product of the i^{th} row and the j^{th} column of matrix A . The j^{th} column of A indicates the input required to produce one unit of output j ; and the i^{th} row of A indicates the input of the i^{th} sector needed to produce one unit of output in each sector. Therefore $a_{ij}^{(2)}$ is precisely the amount of sector i goods needed to produce the direct inputs needed to produce the direct input requirements of one unit of final demand for product j .

⁷The SIC's belonging to each sector are reported in Table A2 in the Appendix.

the smallest total output effects are produced by increases in the final demands of Utilities; Mining; and Distilleries, Breweries and Wineries.

Upon examining the three components of the total output effects we find that the Communications and Other Services sector contributes the largest total induced output effect. Motor Vehicles and Aircraft, and Agriculture, Forestry and Fishing rank second and third respectively. It is not surprising that the larger the coefficient c_j^* is, the larger the induced output effect of a dollar increase in the final demand of sector j .

The largest total indirect output effects are generated by increases in the final demands of Plastics and Synthetic Resins; Meat and Poultry; Dairy Products; Other Food Industries; Leather and Leather Products; Paint and Varnish. The largest total direct output effects are produced by Plastics and Synthetic Resins; Petroleum Refineries and Coal Products; Meat and Poultry and Dairy Products.

It is rather difficult to explain the factors that determine these rankings without disaggregating the total effects into their respective components. Consequently, we proceeded to break-down the elements of b_{ij} , c_{ij} and a_{ij} . Thus, let

$$Y_{ij} = b_{ij} - c_{ij}$$

$$\text{for all } (i = 1, \dots, n; j = 1, \dots, n) \quad (13)$$

$$\Phi_{ij} = c_{ij} - a_{ij}$$

$$\text{for all } (i = 1, \dots, n; j = 1, \dots, n) \quad (14)$$

and

$$\beta_{ij} = a_{ij}$$

$$\text{for all } (i = 1, \dots, n; j = 1, \dots, n) \quad (15)$$

The indices in (13), (14) and (15) reveal the detailed composition of the direct, indirect and induced output effects in every sector i generated in response to a dollar increase in the final demand of the j^{th} sector. Table A1 in the Appendix presents these coefficients for the 49 sectors. Every entry in this table consists of three items arranged in the following order β_{ij} . For instance, a

Φ_{ij}

Y_{ij}

dollar increase in the final demand of Agricultural goods will result in $\beta_{11} = .06656$

$$\Phi_{11} = 1.06193$$

$$Y_{11} = .16051$$

dollar's worth of direct, indirect and induced

Chart 1 – Total Direct, Indirect, and Induced Output Effects by Industry

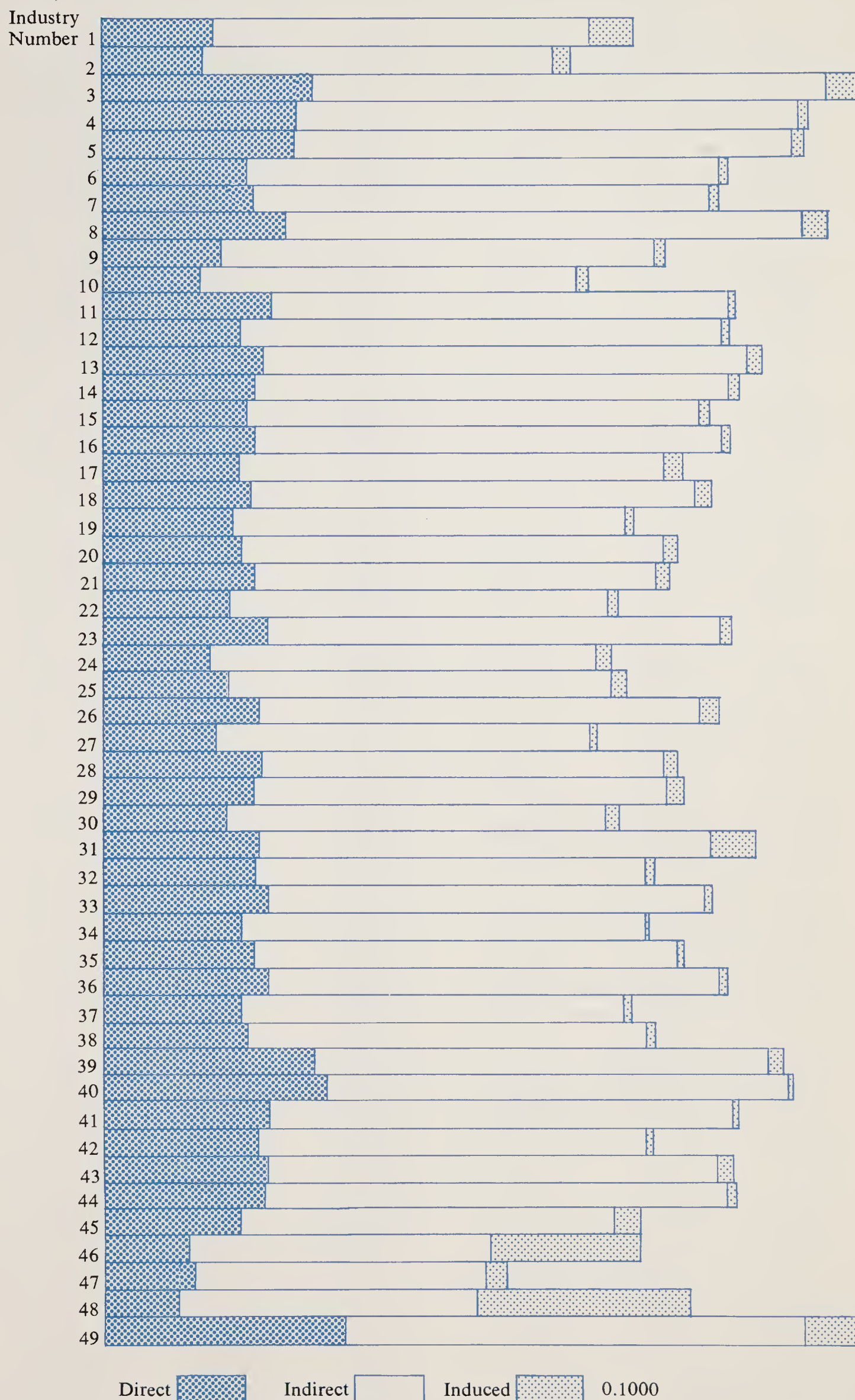


Table 1 — Total Direct, Indirect and Induced Output Effects

Industry No.	Industry	Total Direct Effect	Total Indirect Effect	Total Induced Effect
1	Agriculture, Forestry and Fishing	.47408	1.63964	.16051
2	Mining	.42647	1.54553	.06259
3	Meat and Poultry	.86032	2.21302	.10363
4	Dairy Products	.81443	2.12750	.03709
5	Grain Mills	.81210	2.09079	.04436
6	Biscuits and Bakeries	.60415	1.99691	.02395
7	Sugar and Confectioneries	.62622	1.93680	.02708
8	Other Food Industries	.76988	2.18242	.09097
9	Soft Drinks	.52866	1.82512	.01173
10	Distilleries, Breweries and Wineries	.40544	1.60286	.02111
11	Tobacco and Tobacco Products	.73507	1.95699	.00785
12	Rubber Products	.59199	1.97967	.01972
13	Leather and Leather Products	.65154	2.07491	.01766
14	Cotton Yarn and Cloth	.64075	1.97003	.02856
15	Synthetic Textiles	.62017	1.92368	.03485
16	Knitting Mills	.64691	1.95943	.01176
17	Clothing Industries	.57036	1.81569	.06937
18	Other Textile Mills	.60667	1.90655	.04215
19	Sawmills	.54558	1.64641	.00929
20	Furniture and Fixtures	.57684	1.78080	.02102
21	Other Wood Industries	.60675	1.71712	.00985
22	Pulp and Paper Mills	.52267	1.61523	.02908
23	Paper Products	.67405	1.94074	.03598
24	Printing and Publishing	.45500	1.57203	.04599
25	Iron and Steel Mills	.50169	1.60149	.05880
26	Other Primary Metals	.65004	1.89010	.05481
27	Fabricated and Structural Metals	.49927	1.59339	.00456
28	Metal Stamping, Pressing and Coating	.65076	1.77256	.01524
29	Other Metal Fabricating Industries	.61467	1.81530	.06398
30	Miscellaneous Machinery	.52854	1.64217	.00763
31	Motor Vehicles and Aircraft	.64927	1.93237	.23033
32	Other Transportation Equipment	.64358	1.85198	.01090
33	Electrical Appliances	.65549	1.86361	.01421
34	Electrical Industrial Equipment	.55443	1.75946	.00437
35	Communication Equipment	.60156	1.85025	.01555
36	Other Electrical Products	.66335	1.96815	.00825
37	Clay, Lime and Cement	.55693	1.67036	.01073
38	Other Non-metallic Mineral Products	.57137	1.76339	.01638
39	Petroleum Refineries and Coal Products	.86372	1.92568	.07296
40	Plastics and Synthetic Resins	.90566	2.49589	.01493
41	Paint and Varnish	.67557	2.07850	.01038
42	Pharmaceuticals and Medicines	.62516	1.93170	.01671
43	Other Chemical Industries	.64449	1.95212	.07358
44	Miscellaneous Manufacturing Industries	.63064	2.01431	.03998
45	Construction, Maintenance and Repair	.54080	1.63324	.09376
46	Transportation, Storage and Trade	.31570	1.37097	.64264
47	Utilities	.33609	1.28666	.08516
48	Communications and Other Services	.26441	1.31835	.89616
49	Unallocated Sector	.99847	1.98357	.20308

output effects in the Agricultural sector respectively. Accordingly, Table A1 allows us to assess the various direct, indirect and induced linkages among sectors and thus serves as a basis for the development of the various coefficients of linkages in the system.

A matter related to the direct, indirect and induced output effects of a dollar increase in the final demand of a given sector, is the income effects of that change. The mapping of output into income in the input-output context turns out to be a simple matter since the information needed to carry the mappings are part of the input-output system.

III SECTORAL INCOME AND EMPLOYMENT MULTIPLIERS IN THE ONTARIO ECONOMY

The macro "Keynesian" multipliers and in particular the income multipliers are simply the overall total of direct and indirect effects of a dollar increase in final demand. This summing of direct and indirect income effects is quite similar to the summing of the direct and indirect output effects in the input-output context discussed in the preceding section. In fact, it is also possible to use the input-output techniques to evaluate the income effect due to a change in final demand. By its very nature macroeconomics is concerned with the economy at large but strictly at the most general level and this is also true of its income multipliers. The question of what industries will produce the extra output when final demand is increased is irrelevant to macroeconomic analysis. This shortcoming of macroanalysis can, however, be eliminated if the input-output method is used instead.⁸ Input-output analysis deals with smaller components of the economy than macroeconomics and its emphasis is on individual sectors not the national total.

Starting with the input-output system in (1) we may change the gross output vector into total income η :

$$\eta = \mathbf{h} (\mathbf{I} - \mathbf{A})^{-1} \mathbf{f} \quad (16)$$

The relationship (16) can be allocated to industries by post multiplying it by the standard basis vector \mathbf{e}_j instead of the vector \mathbf{f} . Thus:

$$\eta_j = \mathbf{h} (\mathbf{I} - \mathbf{A})^{-1} \mathbf{e}_j \quad (17)$$

The vector of incomes generated directly and indirectly by a dollar increase in the final demand of the various sectors will then be

$$\mathbf{y} = \mathbf{h} (\mathbf{I} - \mathbf{A})^{-1} \quad (18)$$

⁸C. Yan, *Ibid.*, pp. 65 - 69.

Table 2 — Simple and Induced Income and Employment Multipliers

Industry No.	Industry	Value Added Per Dollar's Worth of Output	Wage Value Added Per Dollar's Worth of Output	Income Multiplier — No Induced Effects	Income Multiplier With Induced Effects	Employment Multiplier — No Induced Effects	Employment Multiplier With Induced Effects
1	Agriculture, Forestry and Fishing	.53	.10	1.56551	4.42093	2.61825	9.64012
2	Mining	.57	.21	1.06281	3.00137	1.20423	3.66218
3	Meat and Poultry	.14	.10	5.55516	15.68770	3.21226	9.58030
4	Dairy Products	.19	.14	5.16308	14.58039	3.12255	8.91324
5	Grain Mills	.19	.10	3.33570	9.41984	2.83987	8.33129
6	Biscuits and Bakeries	.40	.29	2.29001	6.46690	1.78403	4.35328
7	Sugar and Confectioneries	.37	.19	1.59182	4.49523	1.54746	4.14983
8	Other Food Industries	.23	.11	2.97304	8.39578	2.73231	7.78172
9	Soft Drinks	.47	.30	1.41421	3.99373	1.25616	3.11889
10	Distilleries, Breweries and Wineries	.59	.16	1.24670	3.52069	1.62957	5.45368
11	Tobacco and Tobacco Products	.26	.08	3.66651	10.35412	4.14729	13.75671
12	Rubber Products	.41	.23	2.05230	5.79555	1.90315	4.91473
13	Leather and Leather Products	.35	.30	2.11598	5.97553	1.59196	3.64223
14	Cotton Yarn and Cloth	.36	.25	1.05007	2.96536	.89556	2.16005
15	Synthetic Textiles	.38	.18	1.56639	4.42340	1.57950	4.31561
16	Knitting Mills	.35	.24	2.61159	7.37512	2.16554	5.35004
17	Clothing Industries	.43	.24	.89359	2.52344	.86169	2.21388
18	Other Textile Mills	.39	.18	1.63963	4.63032	1.73117	4.69590
19	Sawmills	.45	.26	1.01215	2.85829	.98906	2.48675
20	Furniture and Fixtures	.42	.31	2.16802	6.12245	1.80821	4.24262
21	Other Wood Industries	.39	.29	1.83007	5.16820	1.53842	3.63038
22	Pulp and Paper Mills	.48	.21	1.42941	4.03660	1.48077	4.22944
23	Paper Products	.33	.22	2.57662	7.27625	2.12043	5.23677
24	Printing and Publishing	.55	.39	1.78824	5.04995	1.49021	3.54542
25	Iron and Steel Mills	.50	.20	1.14010	3.21961	1.19857	3.52258
26	Other Primary Metals	.35	.24	1.44892	4.09168	1.24696	3.01613
27	Fabricated and Structural Metals	.50	.25	1.68974	4.77191	1.60328	4.39030
28	Metal Stamping, Pressing and Coating	.35	.20	2.70693	7.64420	2.35728	6.21584
29	Other Metal Fabricating Industries	.39	.26	2.03767	5.75446	1.73340	4.26384
30	Miscellaneous Machinery	.47	.24	1.68572	4.76048	1.66287	4.47431
31	Motor Vehicles and Aircraft	.35	.16	2.01228	5.68267	2.13561	5.78678
32	Other Transportation Equipment	.36	.23	1.91920	5.41977	1.67158	4.12544
33	Electrical Appliances	.34	.22	2.69615	7.61393	2.32622	5.86588
34	Electrical Industrial Equipment	.45	.29	2.17289	6.13610	1.93577	4.71499
35	Communication Equipment	.40	.26	2.10170	5.93515	1.88898	4.57414
36	Other Electrical Products	.34	.22	2.07815	5.86861	1.78365	4.37652
37	Clay, Lime and Cement	.44	.23	1.87065	5.28262	1.81031	4.82229
38	Other Non-metallic Mineral Products	.43	.28	1.62949	4.60166	1.43705	3.53973
39	Petroleum Refineries and Coal Products	.14	.04	5.25069	14.82764	7.20026	21.54019
40	Plastics and Synthetic Resins	.09	.05	7.47293	21.10318	7.05882	19.05000
41	Paint and Varnish	.32	.19	2.13092	6.01768	1.86499	4.86596
42	Pharmaceuticals and Medicines	.37	.24	1.66540	4.70866	1.46039	3.67482
43	Other Chemical Industries	.36	.16	2.16881	6.12462	2.28770	6.38336
44	Miscellaneous Manufacturing Industries	.37	.28	2.06922	5.84342	1.65540	3.90740
45	Construction, Maintenance and Repair	.46	.35	2.17768	6.14975	1.80949	4.17481
46	Transportation, Storage and Trade	.68	.42	.97419	2.75109	.90236	2.22312
47	Utilities	.66	.18	1.05083	2.96755	1.23019	4.51455
48	Communications and Other Services	.74	.23	1.26619	3.57563	1.44813	4.84027
49	Unallocated Sector						

where η_j is the j^{th} component of vector \mathbf{y} and

$$\eta = \sum_{j=1}^n \eta_j.$$

But \mathbf{y} represents the income vector that could be generated from a dollar increase in the final demands of the respective industries if the economy generated all its direct and indirect output requirements domestically. Since this is not true for Ontario we have to adjust the output requirements to reflect net domestic production. This can easily be done by multiplying system (18) by a diagonal matrix $\hat{\mathbf{L}}$ whose diagonal entries are the net domestic output per dollar of total supplies. Therefore:

$$\mathbf{Y}_d = \mathbf{h} (\mathbf{I} - \mathbf{A})^{-1} \hat{\mathbf{L}} \quad (19)$$

The symbol \mathbf{Y}_d refers to the domestic income vector.

Generalizing the procedure adopted by F. T. Moore, we calculate what he refers to as simple income multipliers.⁹

$$\mathbf{m}^y = \mathbf{h} (\mathbf{I} - \mathbf{A})^{-1} \hat{\mathbf{L}} (\hat{\mathbf{H}})^{-1} \quad (20)$$

where $\hat{\mathbf{H}}$ is a diagonal matrix whose diagonal entries are the respective components of \mathbf{h} . These multipliers reflect the total increase in Ontario income when the income of a given industry is increased by one dollar.

Similarly we can calculate what we shall refer to as the simple "employment" multipliers:

$$\mathbf{m}^w = \mathbf{w} (\mathbf{I} - \mathbf{A})^{-1} \hat{\mathbf{L}} (\hat{\mathbf{W}})^{-1} \quad (21)$$

where \mathbf{w} is a row vector of the wage value added per dollar of output and $\hat{\mathbf{W}}$ is a diagonal matrix whose diagonal entries are the components of the \mathbf{w} vector.¹⁰

The above simple income and "employment" multipliers take into account only the income generated by the total production requirements of one dollar's worth of output of sector j . But as we have already noted earlier the repercussions of the initial change in final demand do not end here. We have therefore constructed another set of multipliers which we shall call induced multipliers.

Let $\mathbf{Q} = (\mathbf{I} - \mathbf{B})^{-1}$ and $\bar{\mathbf{Q}}$ be the sub-matrix of \mathbf{Q} which is formed by deleting the last column and row of \mathbf{Q} . Then:

$$\text{and } \begin{aligned} \bar{\mathbf{m}}^y &= \mathbf{h} (\bar{\mathbf{Q}}) (\hat{\mathbf{H}})^{-1} \hat{\mathbf{L}} \\ \bar{\mathbf{m}}^w &= \mathbf{w} (\bar{\mathbf{Q}}) (\hat{\mathbf{W}})^{-1} \hat{\mathbf{L}} \end{aligned} \quad (22)$$

indicate the vectors of induced income and employment multipliers respectively.

The four sets of multipliers are presented in Table 2 under the appropriate headings. The results of this table indicate that Plastics and Synthetic Resins; Meat and Poultry; Petroleum Refineries and Coal Products and Dairy Products generate respectively the largest simple and induced income multipliers in Ontario. Grain Mills; Other Food Industries; Tobacco and Tobacco Products; Metal Stamping, Pressing and Coating; Electrical Appliances and Knitting Mills also generate significant income multipliers, both simple and induced.

The order and composition of sectors is slightly altered when we consider "employment" multipliers. Petroleum Refineries and Coal Products rank highest; next down the list we have: Plastics; Tobacco; Meat and Poultry and Dairy Products. It is interesting to note that Agriculture which ranks 36th among income multiplier generating industries in Ontario, is however the eighth largest contributing sector to employment generation. Furthermore, the Construction sector which is generally considered to be a high employment and income generating sector does not rank as high as expected. In fact, it ranks slightly above average in generating income multipliers and not as high as the average in generating employment multipliers.

Generally the set of "Food" industries exhibits both large income and employment multipliers, while primary industries such as Mining and Primary Metals have on average both low income and employment multipliers. The results presented above hold equally for simple multipliers and induced multipliers; the basic difference is that of magnitude and, therefore, slight changes in rankings.

We have already mentioned that the entries of Table A1 form a basis for classifying and identifying various sectoral interdependencies. In the next two sections we shall illustrate some of its uses in these reports.

IV TYPES OF PRODUCTIVE SECTORS IN ONTARIO

The interdependence among productive sectors can be studied from several points of view. This section is devoted to the analysis of types of productive sectors by grouping

industries according to the pattern of output distribution and input sources. We contend that the characteristics of an industry are in part describable by the proportions of its output sold to other industries (for intermediate use) and to final demand; and also by the proportion of the ultimate factors of production used to produce a given commodity, that are employed in the sector producing that commodity.

$$\text{Let } \phi_i = \frac{\text{total sales of intermediate product by industry } i}{\text{total output of industry } i}$$

A large ϕ_i means that industry i is an important supplier of materials and semi-finished goods rather than a supplier of final goods.

Actually,

$$\phi_i = \sum_{j=1}^n a_{ij} = \sum_{j=1}^n \beta_{ij} = a_{i.} \quad (23)$$

Similarly, let λ_j denote the proportion of inputs purchased from other industries by industry j :

$$\lambda_j = \frac{\text{total purchases of intermediate inputs by industry } j}{\text{total output of industry } j}$$

Or,

$$\lambda_j = \sum_{i=1}^n a_{ij} = \sum_{i=1}^n \beta_{ij} = a_{.j} \quad (24)$$

A large λ_j means that a large proportion of industry j 's output is made up of intermediate products acquired from other producing industries.¹¹

For the economy as a whole, the extent of indirect factor use and the extent of indirect demand are the same if we make allowance for foreign trade. The ratio of inter-sectoral use to total production of .610 constitutes a weighted average of either the ϕ 's or the λ 's.

$$.610 = \frac{\sum_{i=1}^n \phi_i}{n} = \frac{\sum_{j=1}^n \lambda_j}{n} \quad (25)$$

However, there exists no necessary connection between the two measures for any single sector.

In as much as the study of sectoral inter-relatedness involves the relation of sectors on both the demand and supply sides, we

⁹F. T. Moore, "Regional Economic Reaction Paths", American Economic Review, (May, 1955), pp. 133-148.

¹⁰For convenience's sake we measure labour not in man-years but in terms of the total wages

and salaries. The relationship between salaries and wages and that of man-years is straight forward and one can therefore use these terms interchangeably.

¹¹For a detailed coverage of these points and as

a possible reference to other countries' coefficients see H. B. Chenery and T. Watanabe, "International Comparisons of The Structure of Production", Econometrica, (October, 1958), pp. 487-521.

Table 3 – Types of Productive Sectors

<div>Output</div> <div>Input</div>	Final (Low Ø)			Intermediate (High Ø)				
Manufacturing (High λ)	I – Final Manufacture			II – Intermediate Manufacture				
			λ	Ø			λ	Ø
	33	Electrical Appliances	.655	.033	14	Cotton Yarn and Cloth	.641	.672
	42	Pharmaceuticals and Medicines	.625	.060	8	Other Food Industries	.770	.727
	16	Knitting Mills	.647	.073	29	Other Metal Fabricating Industries	.615	.784
	11	Tobacco and Tobacco Products	.735	.145	15	Synthetic Textiles	.620	.833
	36	Other Electrical Products	.663	.162	23	Paper Products	.674	.854
	41	Paint and Varnish	.676	.178	26	Other Primary Metals	.650	1.434
	32	Other Transportation Equipment	.643	.184	43	Other Chemical Industries	.645	1.811
	40	Plastics and Synthetic Resins	.906	.594	49	Unallocated Sector	.998	3.150
	13	Leather and Leather Products	.651	.228				
	4	Dairy Products	.814	.270				
	31	Motor Vehicles and Aircraft	.649	.372				
	28	Metal Stamping, Pressing and Coating	.651	.283				
	5	Grain Mills	.812	.380				
	39	Petroleum Refineries and Coal Products	.864	.400				
	7	Sugar and Confectioneries	.626	.414				
	44	Miscellaneous Manufacturing Industries	.631	.419				
3	Meat and Poultry	.860	.528					
Primary Production (Low λ)	III – Final Primary Production			IV – Intermediate Primary Production				
			λ	Ø			λ	Ø
	6	Biscuits and Bakeries	.604	.008	22	Pulp and Paper Mills	.523	.657
	9	Soft Drinks	.529	.009	18	Other Textile Mills	.607	.713
	20	Furniture and Fixtures	.577	.045	2	Mining	.426	1.04
	17	Clothing Industries	.570	.045	48	Communications and Other Services	.264	1.96
	30	Miscellaneous Machinery	.528	.045	1	Agriculture, Forestry and Fishing	.474	2.06
	10	Distilleries, Breweries and Wineries	.405	.049	25	Iron and Steel Mills	.502	2.10
	27	Fabricated and Structural Metals	.500	.100	46	Transportation, Storage and Trade	.316	2.60
	34	Electrical Industrial Equipment	.554	.103				
	35	Communication Equipment	.602	.259				
	12	Rubber Products	.592	.267				
	37	Clay, Lime and Cement	.557	.270				
	24	Printing and Publishing	.455	.327				
	45	Construction, Maintenance and Repair	.541	.354				
	38	Other Non-metallic Mineral Products	.571	.430				
	19	Sawmills	.546	.576				
	47	Utilities	.336	.596				
21	Other Wood Industries	.607	.315					

shall begin by classifying sectors according to these two measures. Specifically, we will use a simple two-way classification for each measure, based on whether the values of ϕ 's and λ 's are below or above their mean values.

These are shown in Table 3 for each industry and their distribution in Table 4. Since the value of these coefficients depends

on the classification used, a greater degree of disaggregation would sharpen the distinction between final and intermediate on the one hand, and between manufacturing and primary on the other hand. Despite the blurring due to aggregation, the distinction between manufacturing and primary, and between final and intermediate is sufficiently

clear and few sectors, as Table 4 reveals, are close to their mean values.

The present system of classifications attempts to focus on the different roles played by various sectors in the total process of production. Those sectors that fall under Final Primary are relatively independent of other producers and provide a direct link

Table 4 – The Distribution of \emptyset_i and λ_j [illegible]

between final users and the owners of primary factors. Those in category II — Intermediate Manufacture are at the other extreme. The cost of their use of primary factors of production is less than the cost of their purchased inputs, and more than 60 per cent of their output goes to other producers.¹²

It is worth noting that industries with large multipliers and large induced and indirect output effects fall under Final Manufacture, while industries with low multipliers and output effects fall under Final Primary.

Some economists have gone as far as discerning a pattern of production over time. In a rough way they maintain that categories III, II, I may be thought of as successive stages of production.¹³

It is indeed true that sectors under category I represent a list of "mature" sectors, but whether one can discern a historical pattern of sectors maturing from stage III into II into I remains an open question and is beyond the scope of this paper.

The distinctions which we have drawn so far neglect the fact that inter-sectoral transactions may involve either one or many other sectors and that the resulting patterns of interdependence might, at least *a priori*, take an infinite variety of forms. In particular the coefficients used only reflect direct relationships, but we have already pointed out that an industry with little or no direct influence on the system may generate significant impact through its indirect effects and/or induced effects. In the subsequent section we turn to the use of direct and indirect effects adjusted by their measures of dispersion as means of identifying key sectors.

V THE KEY SECTORS IN THE ECONOMY OF ONTARIO

The averages of the total input requirements for a unit increase in the final demand for the j^{th} sector

$$\frac{1}{n} \sum_{i=1}^n c_{ij} = \frac{1}{n} c_{.j} \quad (j = 1, \dots, n) \quad (26)$$

are interpreted by Rasmussen ". . . as an estimate of the direct and indirect increase in output to be supplied by an industry chosen at random if the final demand for the products of industry j ($j = 1, \dots, n$) increases by one unit."¹⁴

A similar interpretation has been suggested by Rasmussen regarding the set of averages:

$$\frac{1}{n} \sum_{j=1}^n c_{ij} = \frac{1}{n} c_{i.} \quad (i = 1, \dots, n) \quad (27)$$

These sets in their present form are not suitable for making intersectoral comparisons and for this purpose the set of averages are normalized by the overall average defined as:

$$\frac{1}{n^2} \sum_{i=1}^n \sum_{j=1}^n c_{ij} = \frac{1}{n^2} \sum_j c_{.j} = \frac{1}{n^2} \sum_i c_{i.} \quad (28)$$

Let us then consider the following indices:

$$U_j = \frac{1}{n} c_{.j} / \frac{1}{n^2} \sum_j c_{.j} \quad (29)$$

and

$$U_i = \frac{1}{n} c_{i.} / \frac{1}{n^2} \sum_i c_{i.} \quad (30)$$

U_j and U_i were interpreted by Rasmussen as the "Index of Power of Dispersion and the Index and Sensitivity of Dispersion". Recently Hazari¹⁵ interpreted them as measures of Hirschman's backward and forward linkages.

Since the average

$$\bar{U} = \sum_{j=1}^n U_j / n = \sum_{i=1}^n U_i / n = 1 \quad (31)$$

it implies for any sector i with $U_i > 1$, that its output will have to increase more than others for a unit increase in the final demand of the whole system. Similarly, for any sector j with $U_j > 1$, it implies that sector j absorbs more than the average of the whole system of outputs of other sectors, and vice versa, if $U_j < 1$. Hazari justifiably notes that the indices in (29) and (30) are based on the method of averaging and therefore influenced by extreme values and may give misleading results.¹⁶ He also devised two other indices to be used in conjunction with U_i and U_j . These are shown in equations (32) and (33).

A high V_j may be interpreted as indicating that a particular industry draws heavily on one or a few sectors and a low V_j as a sector drawing evenly from other sectors. Similarly one can interpret the V_i 's in the same way.

Adopting Hazari's criterion, a key sector is one which has:

(a) both U_i and U_j greater than \bar{U} or ($U_j > 1$ and $U_i > 1$),

and

(b) both V_i and V_j are low relative to their averages.

This definition of key sectors can again be identified with Hirschman's definition of a key sector as one with high forward and backward links. Hirschman's definition, however, does not impose any restrictions on variability.¹⁷

In Table 5 and Table 6 we present a two-way classification of U_j and V_j and their

$$V_j = \left[\left(\frac{1}{n-1} \right) \left[\sum_{i=1}^n \left(c_{ij} - \frac{1}{n} c_{.j} \right)^2 \right] \right]^{1/2} / \frac{1}{n} c_{.j} \quad (32)$$

for all ($j = 1, \dots, n$)

which is equivalent to the standard deviation of the $\sum_{i=1}^n c_{ij}$ divided by their average. This is known as the coefficient of variation index.

Similarly,

$$V_i = \left[\left(\frac{1}{n-1} \right) \left[\sum_{j=1}^n \left(c_{ij} - \frac{1}{n} c_{i.} \right)^2 \right] \right]^{1/2} / \frac{1}{n} c_{i.} \quad (33)$$

for all ($i = 1, \dots, n$)

¹²Chenery and Watanabe, *Ibid.*, pp. 493-497.

¹³Op. cit., p. 494.

¹⁴Norregard P. Rasmussen, *Studies in Inter-Sectoral Relations*, (Amsterdam: North-Holland Publishing Co., 1952), p. 133.

¹⁵Bharat R. Hazari, *Empirical Identification of Key Sectors In The Indian Economy*, Review of Economics and Statistics (May, 1970), pp. 301-305.

¹⁶B. R. Hazari, *Ibid.*, p. 302.

¹⁷A. O. Hirschman, *The Strategy of Economic Development*, (New Haven: Yale University Press, 1958).

Table 5 – Backward Linkages and Their Coefficients of Variation

<div><div>U_j</div><div>V_j</div></div>	Low U _j			High U _j				
Low V _j	I – Sectors with Low Backward Linkage and Low Coefficient of Variation			II – Sectors with High Backward Linkage and Low Coefficient of Variation				
		V _j	U _j		V _j	U _j		
	9	Soft Drinks	3.04	.96	3	Meat and Poultry	3.35	1.26
	17	Clothing Industries	3.15	.97	4	Dairy Products	3.29	1.20
	20	Furniture and Fixtures	3.08	.96	5	Grain Mills	2.94	1.19
	28	Metal Stamping, Pressing and Coating	3.23	.99	6	Biscuits and Bakeries	2.79	1.06
	29	Other Metal Fabricating Industries	3.35	.99	8	Other Food Industries	3.00	1.20
	30	Miscellaneous Machinery	3.40	.89	11	Tobacco and Tobacco Products	3.32	1.10
	34	Electrical Industrial Equipment	3.15	.95	12	Rubber Products	3.25	1.05
	45	Construction, Maintenance and Repair	3.30	.89	13	Leather and Leather Products	3.25	1.11
					15	Synthetic Textiles	3.30	1.04
					16	Knitting Mills	3.00	1.06
					23	Paper Products	3.50	1.07
					32	Other Transportation Equipment	3.45	1.02
					33	Electrical Appliances	2.95	1.03
					35	Communication Equipment	3.43	1.00
					36	Other Electrical Products	2.86	1.07
					39	Petroleum Refineries and Coal Products	3.25	1.14
					40	Plastics and Synthetic Resins	2.89	1.39
					41	Paint and Varnish	2.90	1.12
					42	Pharmaceuticals and Medicines	3.00	1.04
					43	Other Chemical Industries	3.40	1.06
					44	Miscellaneous Manufacturing Industries	3.00	1.08
				49	Unallocated Sector	2.90	1.22	
High V _j	III – Sectors with Low Backward Linkage and High Coefficient of Variation			IV – Sectors with High Backward Linkage and High Coefficient of Variation				
		V _j	U _j		V _j	U _j		
	1	Agriculture, Forestry and Fishing	3.76	.86	7	Sugar and Confectioneries	3.71	1.05
	2	Mining	3.87	.81	14	Cotton Yarn and Cloth	3.92	1.07
	10	Distilleries, Breweries and Wineries	3.63	.82	18	Other Textile Mills	3.57	1.03
	19	Sawmills	4.59	.90	26	Other Primary Metals	4.19	1.04
	21	Other Wood Industries	3.54	.95	31	Motor Vehicles and Aircraft	3.85	1.05
	22	Pulp and Paper Mills	4.45	.87				
	24	Printing and Publishing	3.83	.83				
	25	Iron and Steel Mills	4.16	.86				
	27	Fabricated and Structural Metals	3.65	.85				
	37	Clay, Lime and Cement	3.69	.91				
	38	Other Non-metallic Mineral Products	3.71	.95				
	46	Transportation, Storage and Trade	4.67	.69				
	47	Utilities	5.28	.66				
	48	Unallocated Sector	5.01	.65				

Table 6 – The Distribution of U_j and V_j [illegible]

Table 7 – Forward Linkages and Their Coefficients of Variation

<div><div><div><div><div></div><div>V_i</div></div><div><div>U_i</div></div></div></div></div>	Low U _i			High U _i				
Low V _i	I – Sectors with Low Forward Linkage and Low Coefficient of Variation			II – Sectors with High Forward Linkage and Low Coefficient of Variation				
			V _i	U _i		V _i	U _i	
	3	Meat and Poultry	4.30	.87	1	Agriculture, Forestry and Fishing	2.22	2.03
	5	Grain Mills	4.17	.77	2	Mining	2.25	1.56
	8	Other Food Industries	3.60	.97	15	Synthetic Textiles	3.43	1.02
	18	Other Textile Mills	3.90	.94	22	Pulp and Paper Mills	3.51	1.11
	28	Metal Stamping, Pressing and Coating	4.37	.65	23	Paper Products	3.14	1.14
	39	Petroleum Refineries and Coal Products	3.25	.96	24	Printing and Publishing	2.75	1.10
	40	Plastics and Synthetic Resins	3.78	.84	25	Iron and Steel Mills	2.00	2.03
	44	Miscellaneous Manufacturing Industries	3.90	.81	26	Other Primary Metals	2.50	1.80
45	Construction, Maintenance and Repair	2.96	.96	29	Other Metal Fabricating Industries	2.34	1.34	
				43	Other Chemical Industries	1.90	2.29	
				46	Transportation, Storage and Trade	.84	3.51	
				47	Utilities	3.18	1.08	
				48	Communications and Other Services	.97	3.11	
				49	Unallocated Sector	.87	3.39	
High V _i	III – Sectors with Low Forward Linkage and High Coefficient of Variation			IV – Sectors with High Forward Linkage and High Coefficient of Variation				
			V _i	U _i				
	4	Dairy Products	5.83	.60				
	6	Biscuits and Bakeries	6.64	.43				
	7	Sugar and Confectioneries	5.80	.67				
	9	Soft Drinks	6.71	.43				
	10	Distilleries, Breweries and Wineries	6.37	.46				
	11	Tobacco and Tobacco Products	7.00	.48				
	12	Rubber Products	4.93	.67				
	13	Leather and Leather Products	6.58	.54				
	14	Cotton Yarn and Cloth	4.58	.91				
	16	Knitting Mills	6.72	.44				
	17	Clothing Industries	6.80	.44				
	19	Sawmills	4.94	.84				
	20	Furniture and Fixtures	6.81	.43				
	21	Other Wood Industries	5.00	.64				
	27	Fabricated and Structural Metals	6.00	.48				
	30	Miscellaneous Machinery	6.13	.47				
	31	Motor Vehicles and Aircraft	5.04	.80				
	32	Other Transportation Equipment	6.52	.52				
	33	Electrical Appliances	6.62	.43				
	34	Electrical Industrial Equipment	6.03	.47				
	35	Communication Equipment	5.58	.59				
	36	Other Electrical Products	5.30	.55				
	37	Clay, Lime and Cement	5.08	.64				
	38	Other Non-metallic Mineral Products	4.93	.71				
	41	Paint and Varnish	5.37	.56				
	42	Pharmaceuticals and Medicines	6.25	.47				

Table 8 — The Distribution of U_i and V_i

U_i	V_i
.42634	
.43090	
.43320	
.43581	
.43777	
.44118	
.46446	
.47186	
.47205	
.47536	
.47745	
.47788	
.52579	
.54013	
.55063	
.56435	
.58926	
.60821	
.64542	
.64551	
.65202	
.66629	
.67172	
.71148	
.77228	
.79866	
.81261	
.84112	
.84472	
.86630	
.91192	
.93997	
.95878	
.96007	
.97123	
1.01888	
1.08119	
1.10084	
1.10953	
1.14300	
1.34438	
1.55683	
1.79205	
2.02802	
2.03122	
2.28952	
3.10939	
3.38707	
3.51536	
4.58530	
4.92838	
4.93470	
4.93799	
5.00513	
5.04244	
5.08147	
5.29785	
5.37241	
5.58570	
5.79551	
5.83055	
5.99199	
6.03532	
6.13162	
6.24837	
6.37424	
6.52004	
6.57737	
6.61898	
6.63886	
6.70939	
6.72291	
6.80810	
6.81863	
7.00000	

Table 9 — Key Sectors in the Ontario Economy

Sector	U_j	U_i	V_j	V_i
Synthetic Textiles	1.04	1.02	3.30	3.43
Transportation, Storage and Trade	1.06	2.29	3.40	1.90
Paper Products	1.07	1.14	3.50	3.14
Other Chemical Industries	1.06	2.29	3.40	1.89

Table 10 — Potential Key Sectors in the Ontario Economy

Sector	U_j	U_i	V_j	V_i
Other Metal Fabricating Industries	.99	1.34	3.35	2.34
Other Food Industries	1.20	.97	2.99	3.60
Other Primary Metals	1.04	1.79	4.18	2.50
Plastics and Synthetic Resins	1.40	.84	2.88	3.77
Dairy Products	1.26	.87	3.35	4.30
Miscellaneous Manufacturing Industries	1.08	.81	3.00	3.90

respective distributions. Obviously the sectors that fall under high U_j and low V_j such as Meat and Poultry; Dairy Products; Plastics and Synthetic Resins reveal a high absorption rate from a large number of sectors of the economy. It should be emphasized again that these very same sectors appeared in "favourable" positions with respect to other criteria of classification.

Similarly sectors with high U_i and low V_i can be identified from Table 7 and Table 8. Communications; Other Chemical Industries; Iron and Steel; Agriculture and Mining seem to be the prominent sectors according to this classification that refers to above average supply of direct and indirect output to a large number of other sectors.

The sectors that possess both high U_i and low V_i , and high U_j and low V_j are the key sectors. Surprisingly only four sectors qualify in Ontario and these are sectors that did not rank high under the other criteria used.

Other sectors may qualify were we to relax the strict conditions (a) and (b). Table 10 shows those possible candidates that may have qualified as key sectors but did not because of slight violation of one of the conditions in (a) and (b) while ranking better than average on the rest.

The least prominent sectors according to this criterion and those exhibiting structural and linkage weaknesses are Soft Drinks; Distilleries, Breweries and Wineries; Sugar and Confectioneries; Cotton, Yarn and Cloth; Clothing Industries; Sawmills; Furniture and Fixtures; Other Wood Industries; Fabricated and Structural Metals; Miscellaneous Machinery; Electrical Industrial Equipment; Clay, Lime and Cement; Other Non-Metallic Mineral Products.

VI SECTORAL MARKET DEPENDENCIES

Structural and linkage weaknesses may however be the result of the structure of trade in the economy. It is therefore important to analyse the contribution of the different categories of final demand to the generation of a demand for each individual sector. This necessitated the construction of a final demand matrix F whose typical element f_{ij} represents output of sector i destined to final demand category j . The percentage contribution of the different types of final demand to the generation of demand for each productive sector is described in Table 11 using indices computed from the following system:

$$D = (\hat{X})^{-1} (I - A)^{-1} F \quad (32)$$

where \hat{X} is a diagonal matrix whose diagonal entries are the elements of the gross output vector x . The typical element d_{ij} of matrix D represents the percentage contribution of sector j to the generation of demand for the output of sector i . For instance, d_{11} shows that 65 per cent of the output of the Agricultural sector is generated by household demand, while d_{12} shows that investment accounts for only three per cent of this sector's output.

The magnitudes and signs of these entries are instructive and illuminating. For instance under the last category, Trade Balance and Other Final Demand, a negative sign indicates a net import position, a large positive magnitude may indicate a net export position. This table may serve as a practical guide in searching for optimal industries to attract and develop in Ontario. For instance, if a sector is a net importer we may be interested in attracting new industries or encouraging already existing industries to expand in order to substitute their output for that sector's imports. However, these decisions cannot be made without a thorough review of the sector's standing in the provincial economy. This paper is devoted primarily to the task of assessing the standing of each sector. We have already classified sectors according to more than one criterion. We are thus in a position now to synthesize and consolidate our results.

VII SUMMARY AND CONCLUDING REMARKS

The large number of criteria used to classify and assess sectoral links and standings in the economy clearly reveal that "fundamental" sectors can neither be defined nor identified uniquely. However, it is only logical that we try to synthesize and consolidate our results in a meaningful way that can be used by planners or researchers independent of their different objectives. Table 12 is construed to present this synthesis; sectors are rated plus when they score above or are equal to the average score under that criterion and minus when they score below average. Also the pluses are identified with positive utility in the sense that low V_j 's (below average V_j) are associated with pluses and above average V_j 's with minuses. This is also true for the V_i , imports and exports. Above average importation rates by a given sector are

Table 11 – Percentage Dependence of Sectoral Output on Various Categories of Final Demand

Industry No.	Final Demand Category			Changes in Inventories, Finished Goods and Goods in Process	Changes in Inventories, Raw Materials	Provincial Government Expenditures	Municipal Government Expenditures	Trade Balance and Other Final Demand
	Industry	Personal Consumption Expenditures	Investment					
1	Agriculture, Forestry and Fishing	.645517862	.027881095	.004178986	.003315477	.007794353	.012051727	.299283519
2	Mining	.517351465	.153708860	.026440816	.023426429	.023694807	.065307064	.190033979
3	Meat and Poultry	1.109476697	.018645238	— .000217012	.002944497	.007581281	.012383820	— .150788928
4	Dairy Products	.536954592	.013869348	.003133031	.001902875	.007857326	.010662589	.425654523
5	Grain Mills	1.030694992	.023415288	.004283057	.004256565	.007536309	.011353334	— .081692321
6	Biscuits and Bakeries	.709659657	.011916574	.000627454	.001167449	.006202196	.010313712	.260042990
7	Sugar and Confectioneries	1.287150681	.010521782	.009954987	.005684116	.006136430	.008469624	— .327964175
8	Other Food Industries	.783936506	.015307740	.012288333	.003563951	.005056575	.009865669	.169942764
9	Soft Drinks	.991717842	.019418638	.007409333	.002302431	.006715881	.015493094	— .043241725
10	Distilleries, Breweries and Wineries	.501523500	.014943913	.006205419	.001909337	.001654467	.004024777	.469664132
11	Tobacco and Tobacco Products	.312452997	0.000000000	— .002474674	— .000325437	.000677993	.001098348	.688569521
12	Rubber Products	.349699251	.081000681	.004707449	.006915164	.007018597	.016193974	.534503416
13	Leather and Leather Products	.680363986	.016204442	— .005991926	.005628836	.001621746	.004331610	.297866592
14	Cotton Yarn and Cloth	3.337612181	.154426105	.019328704	.049079435	.019159222	.049301502	— 2.628179480
15	Synthetic Textiles	1.173385791	.092523710	.017262843	.018203032	.007311021	.015787012	— .324377553
16	Knitting Mills	.664167895	.001189601	.002663560	.001142308	.000420877	.001757613	.328813903
17	Clothing Industries	1.816299928	.008135485	.002538323	.000892440	.002281010	.017446169	— .847485658
18	Other Textile Mills	.819361743	.088881019	.008857235	.011153546	.008659588	.014405230	.048647474
19	Sawmills	.757319522	.970708479	.022615903	.037245065	.047289592	.283790985	— 1.118761645
20	Furniture and Fixtures	.548864036	.148068854	.002905826	.001398603	.003861143	.001161665	.293789528
21	Other Wood Industries	.392198449	.468618126	.016778138	.013096556	.028956274	.048032386	.032295580
22	Pulp and Paper Mills	.340566093	.065556220	.005172327	.006574985	.006026741	.014682678	.561464269
23	Paper Products	.563952490	.128611701	.014674000	.012188416	.011690978	.029266885	.239626293
24	Printing and Publishing	.540347079	.102205381	.012656687	.014335008	.014245131	.042042094	.274156322
25	Iron and Steel Mills	.383890325	.284077471	.053668962	.065897363	.017392671	.048247250	.146828232
26	Other Primary Metals	.504894570	.425348577	.026356951	.046109790	.018654167	.091586960	— .112946300
27	Fabricated and Structural Metals	.156889994	.260470801	.020199950	.006822086	.062974891	.222765906	.269976215
28	Metal Stamping, Pressing and Coating	.251172109	.089367947	.009208139	.005515212	.013592462	.012827719	.618312603
29	Other Metal Fabricating Industries	.267523529	.338050038	.023716622	.009322302	.016453310	.045862435	.299069494
30	Miscellaneous Machinery	.107142251	.245363153	.012602109	.002653985	.002726664	.003950154	.625584041
31	Motor Vehicles and Aircraft	.453387730	.096386072	.010143810	.004988684	.001410531	.004312216	.429379277
32	Other Transportation Equipment	.456941664	.386380747	.013395052	.009230805	.005195046	.014592742	.114323050
33	Electrical Appliances	.305395769	.036362159	.010297094	.000899577	.001132150	.002513064	.643457840
34	Electrical Industrial Equipment	.082213765	.181488956	.004299699	.000930216	.003273697	.003217203	.724596601
35	Communication Equipment	.194995525	.188770581	.015488387	.004022782	.005499264	.013973084	.576727568
36	Other Electrical Products	.298165623	.309482673	.016352075	.007347928	.011184695	.017007510	.340488334
37	Clay, Lime and Cement	.237564494	.376694981	.011670251	.010783766	.030365914	.174641499	.158351834
38	Other Non-metallic Mineral Products	.508119569	.184425618	.011688982	.008918509	.010496892	.025489446	.250774532
39	Petroleum Refineries and Coal Products	.882485994	.129233614	.008979037	.008967088	.023858505	.064030499	— .117586229
40	Plastics and Synthetic Resins	.584538984	.155773891	.014598745	.017290491	.010319302	.023083298	.194350699
41	Paint and Varnish	.590004430	.206594646	.017633007	.015285911	.019321337	.038083277	.113010981
42	Pharmaceuticals and Medicines	.901247060	.019935280	.002273786	.002885205	.014948838	.011790869	.046578875
43	Other Chemical Industries	.508790465	.084964755	.013967824	.011936524	.011266466	.027276488	.341791871
44	Miscellaneous Manufacturing Industries	.506425810	.152572277	.016928340	.009961208	.008389436	.019358651	.287152304
45	Construction, Maintenance and Repair	.202579364	.553072804	.001596927	.002294540	.023729540	.028368494	.188364110
46	Transportation, Storage and Trade	1.063266498	.255880984	.016635114	.012492187	.034812705	.053927224	— .437020950
47	Utilities	1.205870490	.123313731	.012030777	.017926838	.015491787	.170493447	— .545098323
48	Communications and Other Services	.898810549	.066960848	.003545802	.005478464	.011943643	.063130622	— .049873546
49	Unallocated Sector	.733809013	.170154223	.014670782	.023934711	.017420686	.045418740	— .005414546

Table 12 — Summary of Results

Industry No.	Industry	Direct Output Effect	Indirect Output Effect	Induced Output Effect	Simple Income Multiplier	Simple Employment Multiplier	Backward Linkage U_1	Backward Linkage V_1	Forward Linkage U_1	Forward Linkage V_1	Production Type	Trade Balance
1	Agriculture, Forestry and Fishing	—	—	+	—	+	—	—	+	+	IP	Exp —
2	Mining	—	—	—	—	—	—	—	+	+	IP	Exp —
3	Meat and Poultry	+	+	+	+	+	+	+	—	+	FM	Imp +
4	Dairy Products	+	+	—	+	+	+	+	—	—	FM	Exp +
5	Grain Mills	+	+	—	+	+	+	+	—	+	FM	Imp +
6	Biscuits and Bakeries	—	+	—	+	—	+	+	—	—	FP	Exp —
7	Sugar and Confectioneries	+	+	—	—	—	+	—	—	—	FM	Imp +
8	Other Food Industries	+	+	+	+	+	+	+	—	+	IM	Exp —
9	Soft Drinks	—	—	—	—	—	—	+	—	—	FP	Imp +
10	Distilleries, Breweries and Wineries	—	—	—	—	—	—	—	—	—	FP	Exp +
11	Tobacco and Tobacco Products	+	+	—	+	+	+	+	—	—	FM	Exp +
12	Rubber Products	—	+	—	+	+	+	+	—	—	FP	Exp +
13	Leather and Leather Products	+	+	—	—	—	+	+	—	—	FM	Exp —
14	Cotton Yarn and Cloth	+	+	—	—	—	+	—	—	—	IM	Imp —
15	Synthetic Textiles	+	+	—	—	—	+	+	+	+	IM	Imp +
16	Knitting Mills	+	+	—	+	+	+	+	—	—	FM	Exp +
17	Clothing Industries	—	—	—	—	—	—	+	—	—	FP	Imp —
18	Other Textile Mills	—	+	—	—	—	+	—	—	+	IP	Exp —
19	Sawmills	—	—	—	—	—	—	—	—	—	IP	Imp —
20	Furniture and Fixtures	—	—	—	+	—	—	+	—	—	IP	Exp —
21	Other Wood Industries	—	—	—	—	—	—	—	—	—	FP	Exp —
22	Pulp and Paper Mills	—	—	—	—	—	—	—	+	+	IP	Exp +
23	Paper Products	+	+	—	+	+	+	+	+	+	IM	Exp —
24	Printing and Publishing	—	—	—	—	—	—	—	+	+	FP	Exp —
25	Iron and Steel Mills	—	—	—	—	—	—	—	+	+	IP	Exp —
26	Other Primary Metals	+	+	—	—	—	+	—	+	+	IM	Imp +
27	Fabricated and Structural Metals	—	—	—	—	—	—	—	—	—	FP	Exp —
28	Metal Stamping, Pressing and Coating	+	—	—	+	+	—	+	—	+	FM	Exp +
29	Other Metal Fabricating Industries	+	—	—	—	—	—	+	+	+	IM	Exp —
30	Miscellaneous Machinery	—	—	—	—	—	—	—	—	—	FP	Exp +
31	Motor Vehicles and Aircraft	+	+	+	—	+	+	—	—	—	FM	Exp +
32	Other Transportation Equipment	+	+	—	—	—	+	+	—	—	FM	Exp —
33	Electrical Appliances	+	+	—	+	—	+	+	—	—	FM	Exp +
34	Electrical Industrial Equipment	—	—	—	+	+	—	+	—	—	FP	Exp +
35	Communication Equipment	—	+	—	+	—	+	+	—	—	FP	Exp +
36	Other Electrical Products	+	+	—	—	—	+	+	—	—	FM	Exp +
37	Clay, Lime and Cement	—	—	—	—	+	—	—	—	—	FP	Exp —
38	Other Non-metallic Mineral Products	—	—	—	—	—	—	—	—	—	FP	Exp —
39	Petroleum Refineries and Coal Products	+	+	+	+	+	+	+	—	+	FM	Imp +
40	Plastics and Synthetic Resins	+	+	—	+	+	+	+	—	+	FM	Exp —
41	Paint and Varnish	+	+	—	—	—	+	+	—	—	FM	Exp —
42	Pharmaceuticals and Medicines	+	+	—	—	—	+	+	—	—	FM	Exp —
43	Other Chemical Industries	+	+	+	+	+	+	+	+	+	IM	Exp +
44	Miscellaneous Manufacturing Industries	+	+	—	—	—	+	+	—	+	FM	Exp —
45	Construction, Maintenance and Repair	—	—	+	+	—	—	+	—	+	FP	Exp —
46	Transportation, Storage and Trade	—	—	+	—	—	—	—	+	+	IP	Imp +
47	Utilities	—	—	+	—	—	—	—	+	+	FP	Imp —
48	Communications and Other Services	—	—	+	—	—	—	—	+	+	IP	Imp +
49	Unallocated Sector	+	+	+	?	?	+	+	+	+	IM	Imp +

rated minus, and plus for below average rates. Similarly, above average exports are rated plus, and below average exports minus.

A striking result of Table 12 is the absence of consistent sectoral ratings. Indeed, very few sectors rank consistently positive or negative under most criteria. Accordingly, few general conclusions can be made concerning the relative standing and contribution of any individual sector or group of sectors without consideration of specific restrictions imposed by the nature of the problem and the objectives of policy makers. However, once the nature of the problem and the objectives are clearly defined, our results should prove useful in assessing the relative contribution of these sectors to the economy at large.

In general, however, the following results may be deduced from the findings reported in the tables:

1. Sectors with a net export position have generally limited forward and backward linkages with the rest of the economy, while sectors showing strong and viable linkages are on average net importers. (This suggests, that Ontario's structure of trade is perhaps sub-optimal, i.e., in the sense that different arrangements may lead to improved domestic sectoral communications and interactions.)
2. The appreciable variation of multipliers suggests that the aggregate assessment and planning of government expenditures and programs should be supplemented by a microsectoral assessment. Furthermore,

contemplated increases in government expenditures should be directed to specific industries with high income and employment effects.

3. Finally, several sectors show insensitivity to induced changes in final demands. Moreover, the induced effects are on average smaller than anticipated relative to other output effects.

This paper represents an initial attempt at assessing the economic contribution and ranking of the individual sectors of the Ontario economy subject to specified restrictions. Although the sectors are highly aggregated these preliminary results will provide a basis for a more detailed analysis of the complex industrial structure of the provincial economy.

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand

Industry No.	Industry	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Biscuits and Bakeries
		1	2	3	4	5	6
1	Agriculture, Forestry and Fishing	.06656	0.00000	.49733	.44577	.33965	.00382
		1.06193	.00941	.24086	.19484	.14688	.14587
		.16051	.16051	.16051	.16052	.16051	.16051
2	Mining	.00130	.05410	.00111	.00158	.00649	.00206
		.04997	1.02647	.04033	.04013	.03514	.02589
		.06259	.06260	.06259	.06260	.06259	.06259
3	Meat and Poultry	.00081	0.00000	.21956	.00906	.04984	.01685
		.01236	.00494	1.07507	.01570	.03408	.03309
		.10363	.10363	.10363	.10364	.10364	.10364
4	Dairy Products	0.00000	0.00000	.00369	.19276	.00466	.01354
		.00284	.00222	.00546	1.05029	.00665	.01123
		.03709	.03710	.03709	.03709	.03709	.03709
5	Grain Mills	.09149	.00000	.00036	0.00000	.05784	.14350
		.01956	.00168	.07542	.06412	1.05796	.03411
		.04436	.04436	.04436	.04435	.04435	.04435
6	Biscuits and Bakeries	0.00000	0.00000	0.00000	.00008	0.00000	0.00000
		.00082	.00097	.00088	.00102	.00101	1.00103
		.02395	.02396	.02396	.02396	.02396	.02396
7	Sugar and Confectioneries	.00020	0.00000	.00028	.01816	.00969	.03448
		.00233	.00056	.00310	.01414	.00815	.01900
		.02708	.02708	.02708	.02708	.02708	.02708
8	Other Food Industries	.00266	0.00000	.02816	.00682	.08295	.13352
		.01668	.00552	.02997	.01862	.03806	.05458
		.09097	.09098	.09098	.09097	.09097	.09098
9	Soft Drinks	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		.00054	.00068	.00058	.00063	.00071	.00066
		.01173	.01174	.01174	.01174	.01173	.01174
10	Distilleries, Breweries and Wineries	0.00000	0.00000	0.00000	0.00000	.00004	0.00000
		.00131	.00180	.00159	.00179	.00201	.00194
		.02111	.02111	.02111	.02111	.02111	.02110
11	Tobacco and Tobacco Products	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		.00785	.00785	.00785	.00785	.00785	.00785
12	Rubber Products	.00191	0.00000	0.00000	0.00000	0.00000	0.00000
		.00486	.00562	.00658	.00685	.00720	.00594
		.01972	.01972	.01972	.01972	.01971	.01972
13	Leather and Leather Products	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		.00039	.00050	.00044	.00047	.00051	.00052
		.01766	.01765	.01766	.01765	.01765	.01765
14	Cotton Yarn and Cloth	.00021	0.00000	0.00000	0.00000	0.00000	0.00000
		.00224	.00114	.00213	.00197	.00420	.00175
		.02856	.02856	.02856	.02856	.02856	.02856
15	Synthetic Textiles	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		.00387	.00194	.00344	.00318	.00739	.00298
		.03485	.03486	.03486	.03486	.03486	.03486
16	Knitting Mills	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		.00003	.00002	.00003	.00003	.00005	.00003
		.01176	.01176	.01176	.01176	.01176	.01176

Sugar and Confection- eries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Knitting Mills	Industry No.
7	8	9	10	11	12	13	14	15	16	
.02236	.17908	0.00000	.01389	.40585	0.00000	0.00000	0.00000	.00007	0.00000	1
.07046	.15671	.04561	.04199	.13495	.01447	.14737	.01155	.01625	.01173	
.16051	.16051	.16052	.16052	.16052	.16052	.16052	.16051	.16052	.16051	
.01837	.00191	.01052	.00231	.00025	.00248	.00267	.00232	.00182	.00195	2
.02527	.03542	.02477	.01489	.03201	.02800	.02313	.01899	.03671	.01915	
.06259	.06260	.06260	.06260	.06259	.06259	.06260	.06260	.06259	.06260	
0.00000	.05195	0.00000	0.00000	0.00000	0.00000	.14991	0.00000	0.00000	0.00000	3
.01119	.04114	.01310	.01074	.00843	.00943	.09568	.00564	.01073	.00687	
.10364	.10363	.10363	.10363	.10364	.10363	.10364	.10363	.10364	.10364	
.03290	.01036	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	4
.02566	.00965	.00801	.00341	.00256	.00224	.00366	.00176	.00212	.00209	
.03709	.03709	.03709	.03710	.03709	.03709	.03710	.03709	.03709	.03710	
.00062	.05113	0.00000	.03317	0.00000	0.00000	.00011	0.00000	0.00000	0.00000	5
.01448	.04834	.01175	.01271	.05361	.00269	.01593	.00223	.00300	.00204	
.04435	.04435	.04435	.04436	.04435	.04435	.04436	.04436	.04436	.04435	
.00044	.00007	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	6
.00123	.00108	.00118	.00088	.00092	.00091	.00098	.00070	.00083	.00089	
.02395	.02395	.02396	.02396	.02396	.02395	.02395	.02395	.02395	.02396	
.25766	.01447	.06853	.00498	.00003	0.00000	.00060	0.00000	0.00000	0.00000	7
1.09315	.01166	.02696	.00429	.00151	.00081	.00157	.00064	.00086	.00061	
.02709	.02709	.02708	.02708	.02708	.02708	.02708	.02708	.02708	.02708	
.04816	.16557	.09192	.04600	0.00000	0.00000	.00144	.00378	0.00000	0.00000	8
.03654	1.05493	.02998	.02016	.01154	.01483	.01688	.00991	.01741	.00850	
.09098	.09098	.09098	.09098	.09097	.09097	.09098	.09097	.09098	.09098	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	9
.00066	.00075	1.00073	.00056	.00060	.00097	.00069	.00060	.00102	.00069	
.01174	.01174	.01173	.01174	.01173	.01173	.01174	.01174	.01174	.01174	
0.00000	.00045	.00235	.03388	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	10
.00217	.00222	.00258	1.00299	.00176	.00181	.00190	.00141	.00169	.00156	
.02111	.02111	.02112	.02111	.02111	.02111	.02111	.02111	.02110	.02111	
0.00000	0.00000	0.00000	0.00000	.14477	0.00000	0.00000	0.00000	0.00000	0.00000	11
0.00000	0.00000	0.00000	0.00000	1.02451	0.00000	0.00000	0.00000	0.00000	0.00000	
.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	
0.00000	0.00000	0.00000	0.00000	0.00000	.13767	.01055	0.00000	0.00000	.00053	12
.00627	.00774	.00730	.00634	.00643	1.02917	.01220	.00579	.00750	.00746	
.01972	.01972	.01972	.01972	.01972	.01972	.01972	.01972	.01971	.01972	
0.00000	0.00000	0.00000	0.00000	0.00000	.00263	.19505	0.00000	0.00000	.00413	13
.00049	.00070	.00063	.00069	.00045	.00217	1.04829	.00058	.00095	.00193	
.01765	.01765	.01765	.01765	.01765	.01765	.01765	.01765	.01765	.01765	
0.00000	0.00000	0.00000	0.00000	0.00000	.01191	.01128	.29332	.04317	.10050	14
.00148	.00204	.00139	.00117	.00182	.01851	.01387	1.15088	.03706	.08877	
.02856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	
0.00000	0.00000	0.00000	0.00000	0.00000	.09903	0.00000	.14553	.10617	.18211	15
.00256	.00353	.00250	.00215	.00300	.03904	.01381	.11474	1.04499	.10670	
.03485	.03485	.03486	.03485	.03486	.03485	.03486	.03486	.03486	.03486	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	.03537	16
.00003	.00004	.00003	.00003	.00003	.00005	.00007	.00021	.00011	1.00153	
.01175	.01175	.01176	.01175	.01176	.01175	.01176	.01175	.01175	.01176	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper Mills
	Industry	17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	.02772 .01435 .16051	.00257 .01156 .16051	.00027 .01057 .16051	.00010 .01141 .16052	.02237 .01569 .16052	.00078 .01173 .16051
2	Mining	.00015 .01480 .06259	.00147 .02002 .06259	0.00000 .01937 .06260	.00174 .02157 .06260	.00141 .01828 .06259	.02168 .02645 .06260
3	Meat and Poultry	0.00000 .00489 .10363	0.00000 .00576 .10363	0.00000 .00295 .10364	0.00000 .00470 .10364	0.00000 .00376 .10363	0.00000 .00469 .10364
4	Dairy Products	0.00000 .00175 .03709	0.00000 .00185 .03709	0.00000 .00173 .03709	0.00000 .00189 .03709	0.00000 .00182 .03709	0.00000 .00169 .03709
5	Grain Mills	0.00000 .00488 .04435	0.00000 .00223 .04436	0.00000 .00160 .04436	0.00000 .00188 .04436	0.00000 .00435 .04436	.00001 .00239 .04436
6	Biscuits and Bakeries	0.00000 .00073 .02395	0.00000 .00077 .02396	0.00000 .00075 .02395	0.00000 .00080 .02396	0.00000 .00076 .02396	0.00000 .00066 .02395
7	Sugar and Confectioneries	0.00000 .00056 .02708	0.00000 .00057 .02708	0.00000 .00040 .02708	0.00000 .00052 .02708	0.00000 .00049 .02708	0.00000 .00064 .02708
8	Other Food Industries	.00101 .00684 .09098	.00007 .00835 .09098	0.00000 .00263 .09098	0.00000 .00645 .09098	0.00000 .00423 .09098	.00615 .00884 .09098
9	Soft Drinks	0.00000 .00053 .01173	0.00000 .00066 .01174	0.00000 .00046 .01174	0.00000 .00059 .01173	0.00000 .00049 .01174	0.00000 .00051 .01173
10	Distilleries, Breweries and Wineries	0.00000 .00129 .02111	0.00000 .00158 .02111	0.00000 .00148 .02111	0.00000 .00148 .02111	0.00000 .00143 .02111	.00010 .00138 .02111
11	Tobacco and Tobacco Products	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785
12	Rubber Products	.00058 .00673 .01972	.00693 .00875 .01972	0.00000 .00446 .01972	0.00000 .00552 .01972	0.00000 .00525 .01971	0.00000 .00431 .01972
13	Leather and Leather Products	.00083 .00130 .01765	.00051 .00099 .01765	0.00000 .00034 .01765	.00075 .00080 .01765	0.00000 .00055 .01765	0.00000 .00040 .01765
14	Cotton Yarn and Cloth	.12324 .09133 .02856	.06435 .06672 .02856	0.00000 .00096 .02856	.01850 .01747 .02856	0.00000 .00141 .02856	0.00000 .00122 .02856
15	Synthetic Textiles	.07197 .08880 .03486	.15834 .08907 .03486	0.00000 .00162 .03485	.04872 .02230 .03486	.00158 .00261 .03485	0.00000 .00216 .03485
16	Knitting Mills	.03608 .00308 .01176	.00077 .00027 .01176	0.00000 .00002 .01176	0.00000 .00006 .01176	0.00000 .00003 .01176	0.00000 .00002 .01176

Paper Products	Printing and Publishing	Iron and Steel Mills	Other Primary Metals	Fabricated and Structural Metals	Metal Stamping, Pressing and Coating	Other Metal Fabricating Industries	Miscellaneous Machinery	Motor Vehicles and Aircraft	Other Transportation Equipment	Industry No.
23	24	25	26	27	28	29	30	31	32	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002	1
.01330	.01115	.00712	.00802	.00571	.00805	.00826	.00744	.00841	.00796	
.16051	.16052	.16051	.16051	.16052	.16052	.16052	.16051	.16051	.16052	
.00959	.00023	.11227	.02719	.00090	.00146	.00395	.00503	.00296	.00231	2
.03471	.01197	.04778	.05601	.06216	.07582	.05022	.05006	.03441	.04780	
.06259	.06260	.06259	.06260	.06259	.06259	.06260	.06259	.06260	.06259	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	3
.00592	.00606	.00341	.00332	.00268	.00351	.00366	.00322	.00363	.00403	
.10363	.10363	.10364	.10363	.10363	.10364	.10363	.10363	.10363	.10363	
.00061	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	4
.00264	.00348	.00177	.00173	.00148	.00183	.00202	.00184	.00179	.00169	
.03710	.03710	.03710	.03709	.03710	.03709	.03710	.03709	.03709	.03709	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	5
.00250	.00208	.00126	.00135	.00101	.00151	.00143	.00129	.00144	.00132	
.04435	.04435	.04435	.04436	.04436	.04435	.04436	.04435	.04436	.04436	
.00052	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	6
.00110	.00157	.00078	.00076	.00066	.00079	.00089	.00081	.00077	.00073	
.02395	.02396	.02396	.02395	.02395	.02395	.02396	.02396	.02396	.02396	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	7
.00074	.00080	.00043	.00041	.00035	.00048	.00047	.00042	.00044	.00041	
.02708	.02708	.02708	.02708	.02708	.02709	.02709	.02708	.02709	.02708	
.00024	0.00000	.00003	0.00000	0.00000	.00201	0.00000	0.00000	0.00000	0.00000	8
.00996	.00607	.00341	.00350	.00265	.00435	.00368	.00339	.00428	.00338	
.09098	.09098	.09098	.09097	.09097	.09097	.09098	.09097	.09098	.09098	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	9
.00073	.00092	.00054	.00048	.00043	.00050	.00057	.00048	.00052	.00047	
.01174	.01174	.01174	.01174	.01174	.01174	.01173	.01174	.01173	.01173	
.00130	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	10
.00216	.00237	.00174	.00142	.00138	.00147	.00173	.00133	.00154	.00136	
.02111	.02111	.02111	.02111	.02111	.02111	.02111	.02111	.02111	.02111	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	11
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	
.00027	.00006	0.00000	0.00000	0.00000	.00024	.00033	0.00000	.02140	0.00000	12

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Electrical Appliances	Electrical Industrial Equipment	Communication Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non-metallic Mineral Products
	Industry	33	34	35	36	37	38
1	Agriculture, Forestry and Fishing	0.00000 .00941 .16052	0.00000 .00811 .16052	0.00000 .00904 .16051	0.00000 .01161 .16052	.00027 .01103 .16052	0.00000 .01060 .16052
2	Mining	.00446 .05793 .06259	.00183 .04212 .06260	.00155 .03751 .06260	.00322 .04557 .06260	.08203 .04172 .06260	.01045 .03370 .06259
3	Meat and Poultry	0.00000 .00442 .10364	0.00000 .00442 .10363	0.00000 .00475 .10364	0.00000 .00573 .10363	0.00000 .00443 .10364	0.00000 .00590 .10364
4	Dairy Products	0.00000 .00215 .03709	0.00000 .00184 .03709	0.00000 .00200 .03710	0.00000 .00248 .03710	0.00000 .00244 .03710	0.00000 .00231 .03710
5	Grain Mills	0.00000 .00168 .04435	0.00000 .00138 .04435	0.00000 .00156 .04436	0.00000 .00207 .04435	0.00000 .00193 .04436	0.00000 .00183 .04435
6	Biscuits and Bakeries	0.00000 .00094 .02396	0.00000 .00081 .02395	0.00000 .00088 .02395	0.00000 .00108 .02395	0.00000 .00106 .02396	0.00000 .00101 .02396
7	Sugar and Confectioneries	0.00000 .00054 .02708	0.00000 .00044 .02708	0.00000 .00050 .02708	0.00000 .00066 .02708	0.00000 .00059 .02708	0.00000 .00058 .02708
8	Other Food Industries	0.00000 .00565 .09097	0.00000 .00372 .09098	0.00000 .00493 .09098	0.00000 .00751 .09097	.00092 .00453 .09097	.00001 .00559 .09098
9	Soft Drinks	0.00000 .00062 .01174	0.00000 .00052 .01173	0.00000 .00057 .01173	0.00000 .00078 .01174	0.00000 .00068 .01174	0.00000 .00069 .01174
10	Distilleries, Breweries and Wineries	0.00000 .00182 .02111	0.00000 .00148 .02111	0.00000 .00144 .02111	0.00000 .00231 .02111	0.00000 .00214 .02110	0.00000 .00205 .02111
11	Tobacco and Tobacco Products	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785
12	Rubber Products	0.00000 .00572 .01972	0.00000 .00549 .01972	.00394 .00658 .01972	0.00000 .00835 .01972	0.00000 .00667 .01972	.02088 .01506 .01972
13	Leather and Leather Products	.00026 .00096 .01765	.00389 .00164 .01765	.00258 .00172 .01765	.00004 .00122 .01765	0.00000 .00056 .01765	.00369 .00258 .01766
14	Cotton Yarn and Cloth	0.00000 .00112 .02856	0.00000 .00102 .02856	0.00000 .00131 .02856	0.00000 .00151 .02856	.00016 .00135 .02856	0.00000 .00228 .02856
15	Synthetic Textiles	0.00000 .00197 .03486	0.00000 .00167 .03486	.00071 .00264 .03486	0.00000 .00288 .03486	0.00000 .00210 .03486	0.00000 .00602 .03485
16	Knitting Mills	0.00000 .00002 .01176	0.00000 .00002 .01176	0.00000 .00002 .01176	0.00000 .00005 .01176	0.00000 .00003 .01176	0.00000 .00003 .01176

[illegible]

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Biscuits and Bakeries
	Industry	1	2	3	4	5	6
17	Clothing Industries	.00014 .00042 .06937	0.00000 .00040 .06936	0.00000 .00057 .06937	0.00000 .00054 .06937	0.00000 .00069 .06936	0.00000 .00051 .06936
18	Other Textile Mills	.00580 .00684 .04215	.00105 .00269 .04215	.00045 .00968 .04216	.00002 .00864 .04216	.01605 .01318 .04216	.00001 .00779 .04216
19	Sawmills	.00024 .00323 .00929	.00001 .00258 .00929	0.00000 .00369 .00929	0.00000 .00337 .00929	0.00000 .00295 .00928	0.00000 .00225 .00929
20	Furniture and Fixtures	0.00000 .00018 .02102	0.00000 .00013 .02102	0.00000 .00017 .02102	0.00000 .00016 .02101	0.00000 .00024 .02102	0.00000 .00013 .02102
21	Other Wood Industries	.00178 .00318 .00985	.00010 .00265 .00985	.00170 .00499 .00985	.00104 .00468 .00985	0.00000 .00421 .00985	0.00000 .00333 .00985
22	Pulp and Paper Mills	0.00000 .00778 .02908	0.00000 .00765 .02907	.00119 .01284 .02907	.00173 .01704 .02908	.00310 .01970 .02907	.00372 .02576 .02907
23	Paper Products	.00087 .01190 .03598	.00089 .00926 .03598	.00973 .01915 .03597	.01973 .02432 .03597	.02406 .02600 .03598	.03395 .03250 .03597
24	Printing and Publishing	0.00000 .02030 .04599	.00000 .02864 .04598	.00094 .02474 .04598	.00214 .02897 .04599	.00246 .03104 .04598	.01939 .03145 .04599
25	Iron and Steel Mills	0.00000 .01702 .05880	.00187 .02271 .05880	0.00000 .01910 .05879	0.00000 .01827 .05880	.00285 .01976 .05880	0.00000 .01795 .05880
26	Other Primary Metals	0.00000 .01428 .05481	.01452 .02791 .05481	.00001 .01457 .05482	0.00000 .01495 .05481	0.00000 .01542 .05481	0.00000 .01366 .05481
27	Fabricated and Structural Metals	0.00000 .00139 .00456	0.00000 .00176 .00457	0.00000 .00126 .00456	0.00000 .00126 .00456	0.00000 .00121 .00456	0.00000 .00094 .00456
28	Metal Stamping, Pressing and Coating	.00003 .00480 .01524	.00156 .00395 .01525	.00416 .00793 .01524	.00425 .00582 .01524	.00115 .01096 .01524	.00023 .01435 .01524
29	Other Metal Fabricating Industries	.00309 .02169 .06398	.02783 .03123 .06398	0.00000 .02565 .06399	0.00000 .02754 .06399	0.00000 .02818 .06398	0.00000 .02474 .06399
30	Miscellaneous Machinery	.01228 .00267 .00763	.00079 .00144 .00763	0.00000 .01017 .00763	0.00000 .00903 .00763	0.00000 .00721 .00763	0.00000 .00288 .00763
31	Motor Vehicles and Aircraft	.00032 .00623 .23033	0.00000 .00912 .23033	0.00000 .00736 .23032	0.00000 .00806 .23033	0.00000 .00878 .23033	0.00000 .00787 .23033
32	Other Transportation Equipment	.00018 .00102 .01090	.00133 .00167 .01090	0.00000 .00118 .01091	0.00000 .00112 .01090	0.00000 .00136 .01090	0.00000 .00100 .01090

Sugar and Confection- eries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Knitting Mills	Industry No.
7	8	9	10	11	12	13	14	15	16	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00143	0.00000	0.00000	17
.00050	.00059	.00052	.00038	.00053	.00047	.00058	.00110	.00055	.00071	
.06936	.06936	.06936	.06936	.06936	.06937	.06937	.06937	.06937	.06936	
.00080	.00104	0.00000	0.00000	.00001	.00102	.01851	.06278	.06482	.16944	18
.00464	.00816	.00411	.00397	.00771	.01668	.01725	.07156	.03580	.08616	
.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	19
.00223	.00295	.00268	.00233	.00436	.00251	.00343	.00199	.00255	.00223	
.00928	.00929	.00929	.00929	.00929	.00928	.00929	.00929	.00929	.00929	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	20
.00011	.00016	.00012	.00012	.00016	.00020	.00033	.00070	.00056	.00127	
.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	
0.00000	.00007	.00133	.00101	.00444	.00030	.00124	0.00000	.00001	0.00000	21
.00353	.00400	.00351	.00280	.00561	.00308	.00452	.00267	.00363	.00334	
.00986	.00985	.00985	.00985	.00985	.00985	.00985	.00985	.00985	.00985	
.01313	.00415	0.00000	.00377	.00450	.00273	.00493	.00145	.03316	.00143	22
.03643	.02323	.03046	.02108	.02159	.02189	.01799	.02343	.03452	.02614	
.02908	.02907	.02908	.02908	.02908	.02908	.02908	.02908	.02907	.02908	
.04127	.02436	.06166	.03635	.03427	.00537	.01089	.00487	.00552	.00805	23
.04143	.03082	.03479	.02318	.02688	.01933	.02081	.01591	.02170	.01703	
.03597	.03598	.03598	.03598	.03598	.03597	.03598	.03597	.03597	.03597	
.01436	.00652	.00900	.00785	.00446	.00079	.00074	.00075	.00027	.00109	24
.03946	.03497	.04087	.02911	.02806	.02902	.03020	.02259	.02686	.02517	
.04599	.04599	.04598	.04599	.04598	.04598	.04599	.04598	.04599	.04599	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	25
.01637	.05051	.03861	.01783	.01545	.01897	.01903	.01041	.01635	.01112	
.05880	.05880	.05879	.05880	.05879	.05880	.05880	.05879	.05879	.05880	
0.00000	0.00000	0.00000	0.00000	.01196	0.00000	0.00000	0.00000	0.00000	0.00000	26
.01442	.02290	.02041	.01309	.02273	.01822	.01911	.01095	.01578	.01246	
.05481	.05481	.05481	.05481	.05481	.05481	.05481	.05481	.05481	.05481	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	27
.00096	.00119	.00100	.00076	.00115	.00112	.00127	.00087	.00098	.00089	
.00456	.00456	.00457	.00456	.00456	.00456	.00456	.00456	.00457	.00456	
.00316	.05711	.04359	.01122	.00004	.00078	0.00000	0.00000	.00034	0.00000	28
.00847	.01722	.00993	.00645	.00370	.00878	.00655	.00473	.01008	.00462	
.01524	.01525	.01524	.01525	.01525	.01525	.01525	.01525	.01525	.01525	
0.00000	0.00000	0.00000	0.00000	0.00000	.01144	.01496	0.00000	0.00000	.00002	29
.02792	.03356	.03396	.02347	.02649	.02808	.03161	.01947	.02384	.02172	
.06398	.06398	.06399	.06399	.06399	.06398	.06398	.06399	.06398	.06398	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	30
.00227	.00537	.00180	.00160	.00774	.00125	.00301	.00096	.00114	.00103	
.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	31
.00891	.00935	.01027	.00743	.00799	.00811	.00893	.00604	.00703	.00668	
.23033	.23033	.23033	.23033	.23033	.23033	.23032	.23033	.23033	.23033	
0.00000	0.00000	0.00000	0.00000	0.00000	.00018	0.00000	0.00000	0.00000	0.00000	32
.00100	.00124	.00106	.00074	.00110	.00114	.00133	.00072	.00088	.00075	
.01090	.01091	.01091	.01090	.01090	.01091	.01091	.01090	.01090	.01090	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper Mills
	Industry	17	18	19	20	21	22
17	Clothing Industries	.03998 1.00239 .06937	.00020 .00066 .06936	0.00000 .00047 .06936	0.00000 .00047 .06937	0.00000 .00051 .06936	0.00000 .00036 .06937
18	Other Textile Mills	.11212 .07135 .04216	.18534 1.07473 .04216	0.00000 .00202 .04216	.02502 .01737 .04216	.00001 .00304 .04216	.00235 .00359 .04215
19	Sawmills	0.00000 .00228 .00929	.00027 .00394 .00929	.28937 1.14119 .00929	.04155 .03789 .00929	.19219 .11614 .00928	.00068 .00783 .00929
20	Furniture and Fixtures	0.00000 .00097 .02101	.00448 .00146 .02102	0.00000 .00040 .02102	.03147 1.00157 .02102	.00378 .00075 .02102	0.00000 .00017 .02102
21	Other Wood Industries	0.00000 .00311 .00985	.00357 .00423 .00986	.05047 .03148 .00985	.05028 .01463 .00985	.10209 1.03154 .00985	.01360 .00885 .00985
22	Pulp and Paper Mills	.00067 .01789 .02908	.00299 .02427 .02908	0.00000 .00685 .02908	.00247 .01735 .02908	.01711 .01668 .02908	.25991 1.09923 .02908
23	Paper Products	.00615 .01403 .03597	.00575 .01612 .03597	0.00000 .00599 .03598	.01475 .01526 .03597	.00405 .00982 .03598	.00161 .00875 .03597
24	Printing and Publishing	0.00000 .02052 .04598	.00065 .02517 .04598	0.00000 .02242 .04598	.00047 .02296 .04598	0.00000 .02149 .04599	.00585 .02311 .04599
25	Iron and Steel Mills	0.00000 .01008 .05880	.00028 .01304 .05879	0.00000 .00914 .05879	.00006 .05597 .05880	.00207 .01630 .05880	0.00000 .00961 .05879
26	Other Primary Metals	0.00000 .01148 .05481	.00361 .01564 .05481	0.00000 .00966 .05481	.00005 .03083 .05482	.00665 .01909 .05481	0.00000 .00990 .05481
27	Fabricated and Structural Metals	.00017 .00077 .00456	0.00000 .00122 .00457	0.00000 .00090 .00456	.05938 .00377 .00457	0.00000 .00140 .00456	0.00000 .00079 .00456
28	Metal Stamping, Pressing and Coating	0.00000 .00408 .01525	.00017 .00503 .01525	0.00000 .00194 .01524	.00006 .00456 .01525	.00045 .00297 .01525	.00001 .00369 .01525
29	Other Metal Fabricating Industries	.00014 .01816 .06398	.00267 .02299 .06399	0.00000 .02100 .06398	.06719 .03264 .06398	.01849 .02410 .06399	0.00000 .01933 .06399
30	Miscellaneous Machinery	.00018 .00130 .00763	.00001 .00108 .00763	0.00000 .00102 .00763	0.00000 .00139 .00763	0.00000 .00147 .00763	0.00000 .00102 .00763
31	Motor Vehicles and Aircraft	0.00000 .00565 .23033	0.00000 .00695 .23033	0.00000 .00668 .23033	0.00000 .00895 .23033	.00027 .00740 .23033	0.00000 .00587 .23033
32	Other Transportation Equipment	0.00000 .00072 .01091	0.00000 .00086 .01090	0.00000 .00092 .01091	.00083 .00218 .01090	0.00000 .00133 .01091	0.00000 .00078 .01090

Paper Products	Printing and Publishing	Iron and Steel Mills	Other Primary Metals	Fabricated and Structural Metals	Metal Stamping, Pressing and Coating	Other Metal Fabricating Industries	Miscel- laneous Machinery	Motor Vehicles and Aircraft	Other Trans- portation Equipment	Industry No.
23	24	25	26	27	28	29	30	31	32	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	17
.00047	.00044	.00036	.00039	.00029	.00035	.00041	.00034	.00042	.00037	
.06937	.06937	.06937	.06936	.06937	.06937	.06936	.06937	.06937	.06937	
.00580	.00070	.00000	.00001	0.00000	.00002	.00017	.00030	.01164	.00051	18
.00725	.00312	.00212	.00249	.00162	.00207	.00292	.00211	.01259	.00362	
.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	
0.00000	0.00000	0.00000	.00012	.00086	.00100	.00172	.00127	.00132	.00892	19
.00753	.00234	.00173	.00335	.00176	.00236	.00436	.00361	.00371	.00993	
.00929	.00929	.00929	.00928	.00929	.00928	.00929	.00929	.00929	.00929	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	.00025	0.00000	.00006	.00014	20
.00024	.00012	.00009	.00014	.00007	.00010	.00016	.00011	.00026	.00023	
.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	
.01044	.00001	.00028	.00154	.00010	.00008	.00351	.00404	.00043	.00236	21
.01103	.00350	.00182	.00389	.00165	.00246	.00351	.00307	.00296	.00471	
.00985	.00985	.00985	.00986	.00985	.00985	.00985	.00985	.00985	.00985	
.15945	.06514	.00048	.00019	0.00000	.00149	.00055	.00133	.00043	0.00000	22
.12419	.03445	.00660	.01162	.00505	.00896	.00970	.01152	.00991	.00701	
.02908	.02907	.02908	.02907	.02908	.02908	.02908	.02908	.02907	.02908	
.21034	.00248	.00005	.01341	0.00000	.00772	.00700	.01923	.00290	.00010	23
1.06759	.00891	.00729	.01935	.00571	.01062	.01369	.01379	.01361	.00978	
.03597	.03598	.03598	.03598	.03598	.03597	.03598	.03597	.03598	.03598	
.01087	.03445	.00014	.00003	0.00000	.00063	.00051	.00012	.00006	0.00000	24
.03197	1.03998	.02779	.02178	.02217	.02327	.02733	.02070	.02420	.02143	
.04598	.04598	.04598	.04598	.04598	.04598	.04599	.04599	.04599	.04598	
.00360	0.00000	.18517	.04700	.35844	.39615	.15863	.20014	.06563	.14643	25
.01699	.01284	1.05722	.07000	.10010	.12127	.09789	.07543	.08130	.12114	
.05880	.05879	.05879	.05879	.05880	.05880	.05880	.05880	.05880	.05880	
.01357	.00046	.01912	.32789	.00593	.05648	.13025	.08997	.04895	.03709	26
.02557	.01342	.03165	1.19096	.03327	.06719	.10791	.07098	.08373	.08183	
.05481	.05481	.05481	.05481	.05481	.05481	.05482	.05481	.05482	.05481	
0.00000	.00034	0.00000	0.00000	0.00000	0.00000	.01303	0.00000	.00052	.00005	27
.00101	.00115	.00101	.00200	1.00122	.00170	.00221	.00123	.00158	.00301	
.00456	.00456	.00456	.00457	.00456	.00456	.00457	.00456	.00456	.00456	
.00086	.00003	.00003	.00429	0.00000	.00004	.00694	.00030	.00345	0.00000	28
.00511	.00258	.00250	.00539	.00207	1.00379	.00413	.00310	.00525	.00453	
.01525	.01524	.01525	.01524	.01525	.01525	.01525	.01524	.01525	.01525	
.00071	.00290	.00313	.03931	.03573	.05649	.07706	.02562	.02024	.11753	29
.02585	.03091	.03040	.04837	.02567	.03296	1.04496	.02912	.03902	.06166	
.06398	.06399	.06399	.06398	.06399	.06399	.06399	.06398	.06399	.06399	
0.00000	0.00000	0.00000	.00040	0.00000	.00002	.00469	.01275	.00414	.00005	30
.00122	.00144	.00123	.00165	.00108	.00138	.00186	1.00131	.00300	.00191	
.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00764	.00763	.00763	
0.00000	0.00000	0.00000	.00623	0.00000	0.00000	.02047	.00053	.28998	.01611	31
.00785	.01018	.00819	.01522	.00752	.00940	.02107	.00840	1.12746	.02270	
.23033	.23032	.23032	.23033	.23033	.23033	.23033	.23033	.23032	.23033	
0.00000	0.00000	0.00000	.00079	0.00000	0.00000	.01198	.00129	.00059	.16445	32
.00102	.00086	.00112	.00251	.00129	.00189	.00486	.00167	.00192	1.03555	
.01090	.01090	.01090	.01090	.01090	.01090	.01090	.01091	.01090	.01091	

Table A1 — Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand — Continued

Industry No.		Electrical Appliances	Electrical Industrial Equipment	Communications Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non-metallic Mineral Products
	Industry	33	34	35	36	37	38
17	Clothing Industries	0.00000 .00042 .06937	0.00000 .00036 .06936	0.00000 .00037 .06937	0.00000 .00053 .06936	0.00000 .00056 .06936	0.00000 .00046 .06937
18	Other Textile Mills	.00003 .00278 .04216	.00002 .00227 .04216	.00018 .00269 .04216	.00005 .00392 .04216	.00005 .00293 .04216	.00164 .00430 .04216
19	Sawmills	0.00000 .00307 .00929	0.00000 .00236 .00928	0.00000 .00283 .00929	0.00000 .00330 .00929	.00002 .00261 .00929	.00405 .00582 .00928
20	Furniture and Fixtures	.00052 .00014 .02102	0.00000 .00015 .02102	.00036 .00018 .02102	.00034 .00023 .02102	0.00000 .00012 .02102	.00027 .00021 .02102
21	Other Wood Industries	.00274 .00363 .00986	.00137 .00264 .00985	.00167 .00350 .00986	.00018 .00427 .00986	.00111 .00280 .00985	.00120 .00394 .00985
22	Pulp and Paper Mills	.00089 .01913 .02908	.00038 .00929 .02908	.00224 .01378 .02908	.00407 .01992 .02907	.00949 .01505 .02908	.01110 .02557 .02907
23	Paper Products	.03878 .02229 .03598	.00247 .01550 .03597	.01402 .02044 .03598	.02533 .02421 .03597	.00735 .01205 .03597	.02783 .02512 .03597
24	Printing and Publishing	.00122 .02841 .04598	.00008 .02338 .04598	.00066 .02259 .04598	.00112 .03368 .04598	.00007 .03325 .04598	.00053 .03229 .04599
25	Iron and Steel Mills	.21682 .09222 .05879	.12046 .06772 .05880	.03837 .05320 .05880	.09294 .06348 .05879	.01231 .02265 .05880	0.00000 .01552 .05880
26	Other Primary Metals	.08781 .09264 .05482	.14040 .12396 .05481	.19983 .16325 .05481	.16943 .12504 .05481	.00008 .01972 .05481	.00233 .01850 .05482
27	Fabricated and Structural Metals	0.00000 .00130 .00456	0.00000 .00099 .00456	0.00000 .00111 .00456	0.00000 .00148 .00456	0.00000 .00136 .00456	0.00000 .00108 .00457
28	Metal Stamping, Pressing and Coating	.00013 .00461 .01525	.00022 .00361 .01524	.00015 .00468 .01524	.00064 .00691 .01525	.00019 .00303 .01524	.00047 .00360 .01524
29	Other Metal Fabricating Industries	.01790 .03500 .06399	.00246 .03371 .06398	.00253 .03632 .06399	.01413 .04333 .06399	.01643 .03499 .06399	.00036 .02910 .06398
30	Miscellaneous Machinery	0.00000 .00135 .00763	0.00000 .00116 .00763	0.00000 .00123 .00763	0.00000 .00163 .00763	.00002 .00153 .00763	0.00000 .00132 .00763
31	Motor Vehicles and Aircraft	.00026 .01020 .23033	.00067 .00987 .23033	.00103 .01055 .23033	.00354 .01398 .23033	0.00000 .01005 .23033	0.00000 .00882 .23033
32	Other Transportation Equipment	0.00000 .00147 .01090	0.00000 .00122 .10190	0.00000 .00138 .01090	0.00000 .00173 .01090	0.00000 .00157 .01091	0.00000 .00098 .01090

Petroleum Refineries and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceu- ticals and Medicines	Other Chemical Industries	Miscel- laneous Manufac- turing Industries	Construction, Maintenance and Repair	Transporta- tion, Storage and Trade	Utilities	Communi- cations and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	49	
0.00000	0.00000	0.00000	0.00000	.00006	.00056	0.00000	.00147	0.00000	.00007	.00112	17
.00051	.00066	.00058	.00068	.00055	.00061	.00041	.00041	.00015	.00022	.00087	
.06937	.06936	.06936	.06937	.06937	.06936	.06936	.06936	.06936	.06936	.06936	
0.00000	.00005	0.00000	0.00000	.00109	.01210	.00583	.00173	0.00000	.00093	.00365	18
.00352	.00703	.00424	.00474	.00454	.00966	.00379	.00308	.00130	.00234	.00678	
.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	
0.00000	.00004	0.00000	0.00000	.00037	.00856	.02096	.00058	.00163	.00005	.00021	19
.00315	.00595	.00271	.00331	.00340	.01237	.02152	.00228	.00442	.00356	.00413	
.00929	.00929	.00928	.00929	.00929	.00929	.00929	.00928	.00929	.00929	.00929	
0.00000	0.00000	0.00000	0.00000	0.00000	.00147	.00155	.00003	0.00000	.00005	0.00000	20
.00015	.00037	.00014	.00018	.00017	.00050	.00037	.00011	.00015	.00017	.00028	
.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02120	.02102	.02102	
.00038	.00127	.00001	.00011	.00057	.01415	.03374	.00020	0.00000	.00086	.00003	21
.00322	.00649	.00317	.00390	.00391	.00778	.00864	.00221	.00343	.00357	.00477	
.00985	.00986	.00985	.00985	.00985	.00985	.00986	.00985	.00985	.00985	.00985	
0.00000	.00099	.00023	.00482	.01090	.01220	.00300	.00162	0.00000	.00070	.00273	22
.00884	.03233	.02012	.03103	.02505	.02449	.01029	.00681	.00263	.00467	.03045	
.02908	.02908	.02908	.02908	.02908	.02908	.02908	.02907	.02908	.02907	.02908	
.00176	.00391	.00608	.04446	.02388	.01663	.00575	.00562	0.00000	.00077	.01227	23
.01176	.04263	.02612	.03167	.02609	.02282	.01144	.00672	.00302	.00556	.01966	
.03598	.03597	.03597	.03597	.03597	.03597	.03597	.03598	.03597	.03597	.03598	
.00006	.00007	.00445	.01760	.00320	.00518	0.00000	0.00094	.00031	.00092	.16583	24
.02574	.03885	.03970	.05695	.03597	.03784	.01480	.01971	.00949	.01435	.03203	
.04599	.04598	.04598	.04598	.04599	.04598	.04598	.04598	.04599	.04598	.04598	
.01644	0.00000	0.00000	0.00000	.00359	.01130	.01512	.00047	0.00000	.00001	.00056	25
.03344	.03650	.04426	.03110	.03353	.04670	.05705	.01100	.00823	.00943	.04949	
.05880	.05880	.05879	.05879	.05879	.05880	.05880	.05879	.05879	.05879	.05880	
0.00000	0.00000	0.00000	0.00000	.00442	.03061	.03136	.00023	0.00000	.00013	.00140	26
.03421	.03586	.02509	.02318	.02843	.04954	.05650	.01032	.00914	.01018	.05075	
.05482	.05481	.05481	.05482	.05482	.05481	.05481	.05481	.05481	.05481	.05481	
0.00000	0.00000	0.00000	0.00000	.00018	.00135	.02399	.00003	0.00000	0.00000	0.00000	27
.00183	.00166	.00122	.00133	.00135	.00158	.00194	.00108	.00195	.00193	.00301	
.00457	.00457	.00457	.00457	.00456	.00457	.00457	.00456	.00456	.00456	.00456	
.01302	.00163	.04142	.02269	.01920	.02631	.01188	.00118	0.00000	0.00000	0.00000	28
.00702	.02717	.01706	.00712	.01180	.00896	.00351	.00206	.00165	.00268	.00747	
.01524	.01524	.01525	.01524	.01524	.01525	.01525	.01524	.01525	.01524	.01524	
0.00000	0.00000	0.00000	0.00000	.00297	.01369	.07728	.00182	0.00000	.00032	.10917	29
.04665	.03810	.03665	.04534	.03458	.03934	.02869	.01893	.01414	.01711	.03757	
.06398	.06399	.06399	.06399	.06398	.06398	.06398	.06399	.06398	.06399	.06399	
0.00000	0.00000	0.00000	0.00000	0.00000	.00081	.00268	.00070	.00168	.00082	.00311	30
.00189	.00188	.00175	.00201	.00184	.00167	.00138	.00120	.00102	.00104	.00260	
.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	
0.00000	0.00000	0.00000	0.00000	0.00000	.00053	.00112	.00323	0.00000	0.00000	.02783	31
.00836	.01006	.01047	.01460	.00987	.01145	.00852	.00707	.00294	.00412	.02347	
.23033	.23033	.23033	.23033	.23032	.23033	.23032	.23033	.23033	.23033	.23033	
0.00000	0.00000	0.00000	0.00000	.00012	.00033	0.00000	.00232	0.00000	0.00000	.00012	32
.00243	.00141	.00124	.00131	.00132	.00150	.00233	.00118	.00039	.00047	.00339	
.01090	.01091	.01090	.01090	.01091	.01090	.01091	.01090	.01091	.01090	.01090	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Biscuits and Bakeries
	Industry	1	2	3	4	5	6
33	Electrical Appliances	0.00000 .00039 .01421	0.00000 .00059 .01422	0.00000 .00040 .01421	0.00000 .00042 .01421	0.00000 .00043 .01421	0.00000 .00039 .01422
34	Electrical Industrial Equipment	0.00000 .00090 .00437	0.00000 .00117 .00437	0.00000 .00099 .00437	0.00000 .00109 .00437	0.00000 .00112 .00437	0.00000 .00104 .00437
35	Communication Equipment	.00008 .00221 .01555	0.00000 .00266 .01555	0.00000 .00225 .01555	0.00000 .00223 .01555	0.00000 .00223 .01555	0.00000 .00212 .01555
36	Other Electrical Products	0.00000 .00252 .00825	0.00000 .00337 .00825	0.00000 .00279 .00825	0.00000 .00308 .00825	0.00000 .00322 .00825	0.00000 .00299 .00825
37	Clay, Lime and Cement	.00007 .00364 .01073	.00375 .00456 .01072	0.00000 .00350 .01073	0.00000 .00363 .01072	0.00000 .00359 .01073	0.00000 .00306 .01073
38	Other Non-metallic Mineral Products	.00002 .00273 .01638	0.00000 .00282 .01638	.00008 .00349 .01638	.00194 .00402 .01637	0.00000 .00598 .01638	0.00000 .00572 .01637
39	Petroleum Refineries and Coal Products	.04977 .02125 .07296	.01227 .01240 .07297	.00171 .05112 .07296	.00566 .04623 .07297	.00300 .03921 .07297	.00672 .02025 .07296
40	Plastics and Synthetic Resins	.00001 .00362 .01493	.00002 .00368 .01494	.00583 .00682 .01493	.00085 .00541 .01493	.00019 .00650 .01494	.02398 .00901 .01494
41	Paint and Varnish	0.00000 .00300 .01034	0.00000 .00368 .01034	0.00000 .00334 .01035	0.00000 .00360 .01035	0.00000 .00373 .01034	0.00000 .00360 .01035
42	Pharmaceuticals and Medicines	0.00000 .00285 .01671	0.00000 .00147 .01671	0.00000 .00233 .01671	0.00000 .00212 .01671	0.01534 .00348 .01671	0.00000 .00406 .01671
43	Other Chemical Industries	.02832 .02875 .07358	.04628 .02858 .07357	.00088 .05270 .07357	.00084 .04444 .07357	.00011 .04619 .07357	.00028 .05387 .07357
44	Miscellaneous Manufacturing Industries	.00016 .00620 .03998	.00009 .00791 .03998	.00011 .00821 .03998	.00008 .00795 .03998	0.00000 .00905 .03998	0.00000 .01160 .03998
45	Construction, Maintenance and Repair	.02403 .01868 .09376	.02169 .01766 .09376	.00214 .03425 .09376	.00311 .03249 .09376	.00241 .03024 .09376	.00283 .02049 .09375
46	Transportation, Storage and Trade	.07148 .09039 .64264	.04199 .08013 .64265	.03917 .14966 .64264	.02154 .13994 .64264	.11241 .14617 .64264	.06024 .12326 .64264
47	Utilities	.00806 .01314 .08516	.03476 .01945 .08516	.00372 .01963 .08516	.00584 .01942 .08515	.00706 .01909 .08516	.00505 .01546 .08516
48	Communications and Other Services	.05195 .07649 .89616	.05459 .08380 .89616	.00939 .11926 .89617	.02059 .12185 .89617	.01564 .12360 .89617	.03827 .10192 .89617
49	Unallocated Sector	.05028 .06024 .20308	.10698 .05434 .20308	.02861 .10338 .20308	.05085 .10204 .20308	.05511 .10611 .20308	.06172 .09237 .20309

Sugar and Confection- eries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Knitting Mills	Industry No.
7	8	9	10	11	12	13	14	15	16	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	33
.00041	.00050	.00050	.00041	.00042	.00060	.00078	.00031	.00038	.00036	
.01422	.01421	.01422	.01421	.01422	.01422	.01422	.01421	.01421	.01422	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	34
.00116	.00131	.00139	.00102	.00103	.00114	.00126	.00083	.00099	.00092	
.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00436	.00437	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	35
.00192	.00270	.00211	.00170	.00213	.00452	.00257	.00254	.00513	.00263	
.01555	.01555	.01555	.01555	.01555	.01555	.01555	.01555	.01555	.01555	
0.00000	0.00000	0.00000	.00081	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	36
.00330	.00380	.00393	.00321	.00296	.00359	.00356	.00255	.00345	.00279	
.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	
.00007	0.00000	0.00000	0.00000	0.00000	.00258	.00046	0.00000	0.00000	0.00000	37
.00314	.00474	.00380	.00396	.00350	.00422	.00304	.00239	.00356	.00238	
.01073	.01072	.01072	.01073	.01073	.01073	.01072	.01073	.01073	.01073	
.00069	.01250	.00658	.02921	0.00000	.00054	0.00000	0.00000	.00512	0.00000	38
.00438	.00958	.00635	.01122	.00279	.00570	.00354	.00454	.00753	.00485	
.01638	.01637	.01638	.01637	.01637	.01638	.01638	.01638	.01637	.01637	
.00206	.00233	.00824	.00232	.00078	.00300	.00308	.00169	.00613	.00198	39
.01542	.03262	.01288	.01089	.03923	.02253	.02088	.01558	.02890	.01578	
.07297	.07296	.07296	.07296	.07297	.07296	.07297	.07296	.07297	.07297	
.00026	.00220	0.00000	0.00000	.00513	.10855	.01023	.00049	.00264	.00318	40
.00680	.00821	.00813	.00662	.00702	.03825	.01713	.00732	.01067	.01010	
.01493	.01493	.01493	.01494	.01494	.01493	.01493	.01494	.01493	.01494	
0.00000	0.00000	0.00000	0.00000	0.00000	.00546	0.00000	0.00000	0.00000	0.00000	41
.00377	.00494	.00490	.00334	.00337	.00588	.00400	.00291	.00389	.00337	
.01034	.01035	.01035	.01034	.01034	.01034	.01034	.01034	.01035	.01034	
0.00000	.00027	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	42
.00129	.00328	.00136	.00166	.00191	.00335	.00170	.00188	.00454	.00195	
.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	
.00053	.03412	.00075	.00564	.00035	.05717	.01829	.01818	.24078	.00862	43
.03035	.05405	.03192	.02510	.04410	.19320	.05602	.10888	.12488	.11764	
.07357	.07357	.07357	.07357	.07357	.07358	.07357	.07357	.07357	.07357	
.00005	.00310	.00326	.00879	.00021	.00498	.03037	.00032	.00028	.00247	44
.00887	.01092	.01059	.00874	.00844	.02794	.02195	.00900	.01296	.01166	
.03998	.03998	.03997	.03998	.03997	.03998	.03998	.03998	.03997	.03998	
.00345	.00213	.00388	.00294	.00309	.00251	.00200	.00541	.00419	.00224	45
.01912	.02639	.01713	.01375	.02844	.01775	.02039	.01653	.01841	.01740	
.09376	.09376	.09376	.09376	.09376	.09376	.09376	.09375	.09375	.09376	
.04760	.05231	.04714	.02585	.03878	.02875	.05994	.03279	.03058	.02479	46
.11463	.14525	.11055	.08349	.12941	.09953	.12113	.09197	.10338	.09516	
.64265	.64264	.64264	.64264	.64264	.64264	.64264	.64264	.64264	.64264	
.00496	.00404	.00529	.00621	.00137	.00831	.00460	.01158	.00655	.00479	47
.01524	.02038	.01362	.01167	.01588	.02147	.01599	.02151	.02576	.01804	
.08516	.08516	.08516	.08516	.08516	.08515	.08516	.08516	.08516	.08516	
.02946	.01936	.03099	.03378	.01688	.02915	.03052	.01501	.02286	.04348	48
.10916	.12196	.10769	.08023	.11101	.09506	.10508	.07984	.09127	.08772	
.89616	.89617	.89617	.89616	.89617	.89617	.89617	.89617	.89617	.89617	
.08388	.06928	.13363	.09546	.05789	.06467	.06918	.03905	.04568	.05073	49
.09755	.10964	.07767	.05850	.09000	.09103	.09389	.08176	.09455	.08484	
.20309	.20309	.20308	.20309	.20308	.20309	.20308	.20308	.20309	.20309	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper Mills
	Industry	17	18	19	20	21	22
33	Electrical Appliances	0.00000 .00049 .01422	0.00000 .00044 .01422	0.00000 .00030 .01422	0.00000 .00078 .01421	0.00000 .00049 .01422	0.00000 .00028 .01422
34	Electrical Industrial Equipment	0.00000 .00087 .00437	0.00000 .00096 .00437	0.00000 .00085 .00437	0.00000 .00095 .00437	0.00000 .00087 .00437	0.00000 .00078 .00437
35	Communication Equipment	0.00000 .00201 .01555	.00010 .00277 .01555	0.00000 .00144 .01555	.00266 .00292 .01556	0.00000 .00173 .01556	0.00000 .00194 .01555
36	Other Electrical Products	0.00000 .00251 .00825	.00001 .00293 .00825	0.00000 .00241 .00825	.00307 .00300 .00825	0.00000 .00266 .00825	0.00000 .00231 .00825
37	Clay, Lime and Cement	0.00000 .00194 .01073	.00003 .00256 .01073	0.00000 .00209 .01072	0.00000 .00369 .01073	.00006 .00338 .01073	.00463 .00467 .01073
38	Other Non-metallic Mineral Products	0.00000 .00360 .01638	.00034 .00490 .01638	0.00000 .00295 .01638	.00469 .00530 .01638	.01340 .00728 .01637	.00058 .00309 .01638
39	Petroleum Refineries and Coal Products	.00057 .01347 .07296	.00253 .01618 .07297	.01218 .01458 .07296	.00151 .01354 .07296	.00268 .01653 .07296	.00578 .01332 .07297
40	Plastics and Synthetic Resins	.00037 .01067 .01493	.01051 .01239 .01493	0.00000 .00257 .01493	.03141 .01074 .01493	.00379 .00529 .01494	.00085 .00376 .01493
41	Paint and Varnish	0.00000 .00280 .01035	.00095 .00362 .01035	0.00000 .00271 .01035	.00907 .00444 .01035	.00075 .00292 .01035	.00019 .00264 .01035
42	Pharmaceuticals and Medicines	0.00000 .00135 .01671	.00003 .00197 .01671	0.00000 .00067 .01671	0.00000 .00136 .01671	0.00000 .00094 .01671	0.00000 .00132 .01671
43	Other Chemical Industries	.00093 .07517 .07357	.01596 .11396 .07357	.00043 .01355 .07357	.00452 .07168 .07357	.01132 .02527 .07358	.03763 .03976 .07357
44	Miscellaneous Manufacturing Industries	.02805 .01256 .03998	.00869 .01322 .03998	0.00000 .00631 .03998	.00232 .01254 .03998	.00821 .00845 .03998	.00004 .00641 .03998
45	Construction, Maintenance and Repair	.00082 .01530 .09376	.00364 .01586 .09376	.00751 .01644 .09376	.00288 .01618 .09376	.00392 .01810 .09376	.00441 .01595 .09376
46	Transportation, Storage and Trade	.04888 .08258 .64264	.03985 .09429 .64265	.08933 .10886 .64264	.06390 .09342 .64264	.11063 .11184 .64265	.05276 .08237 .64265
47	Utilities	.00221 .01437 .08516	.00521 .01754 .08516	.01003 .01384 .08516	.00522 .01610 .08515	.00807 .01676 .08516	.03393 .03107 .08516
48	Communications and Other Services	.03066 .07617 .89617	.01947 .08463 .89617	.02496 .07951 .89617	.03370 .08222 .89617	.02780 .08415 .89617	.01748 .07169 .89616
49	Unallocated Sector	.03689 .07323 20308	.05433 .08179 .20309	.06102 .06595 .20308	.04850 .07672 .20309	.04360 .07524 .20309	.05163 .06394 .20309

Paper Products	Printing and Publishing	Iron and Steel Mills	Other Primary Metals	Fabricated and Structural Metals	Metal Stamping, Pressing and Coating	Other Metal Fabricating Industries	Miscel- laneous Machinery	Motor Vehicles and Aircraft	Other Trans- portation Equipment	Industry No.
23	24	25	26	27	28	29	30	31	32	
0.00000	0.00000	0.00000	.00089	0.00000	0.00000	.00490	.00333	.00598	0.00000	33
.00046	.00047	.00043	.00120	.00052	.00077	.00131	.00068	.00322	.00153	
.01422	.01422	.01422	.01421	.01422	.01422	.01422	.01421	.01421	.01422	
0.00000	0.00000	0.00000	0.00000	0.00000	.00148	.00038	0.00000	.00154	0.00000	34
.00105	.00136	.00102	.00109	.00083	.00093	.00156	.00107	.00234	.00111	
.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	
0.00000	0.00000	0.00000	.00057	0.00000	0.00000	.00151	0.00000	.00653	0.00000	35
.00277	.00226	.00188	.00260	.00143	.00189	.00267	.00162	.00636	.00232	
.01555	.01555	.01555	.01555	.01556	.01555	.01555	.01555	.01555	.01555	
0.00000	0.00000	.00222	.00176	0.00000	.00061	.00112	0.00000	.00387	.00162	36
.00318	.00385	.00351	.00382	.00337	.00400	.00418	.00313	.00536	.00398	
.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	
.00493	0.00000	.01587	.00912	.00001	0.00000	.00047	.00037	.00011	.00016	37
.00701	.00293	.00962	.01183	.01026	.01271	.00933	.00871	.00714	.00825	
.01073	.01073	.01073	.01073	.01073	.01073	.01073	.01073	.01072	.01073	
.00281	0.00000	0.00000	.00001	0.00000	.00001	.00002	.00041	.01216	0.00000	38
.00526	.00271	.00231	.00262	.00164	.00211	.00280	.00201	.01156	.00271	
.01637	.01637	.01637	.01638	.01637	.01637	.01638	.01638	.01637	.01638	
.00815	.00089	.00151	.01504	.00001	.00147	.00262	.00490	.00135	.00302	39
.01884	.00815	.00986	.01926	.00688	.01061	.01250	.01060	.01206	.01116	
.07296	.07296	.07296	.07296	.07296	.07296	.07297	.07296	.07296	.07296	
.03769	.00175	0.00000	.00032	.00018	.00021	.00019	.00020	.00030	.00085	40
.01999	.00401	.00288	.00416	.00234	.00429	.00434	.00403	.01040	.00637	
.01493	.01493	.01493	.01493	.01493	.01493	.01494	.01494	.01494	.01493	
0.00000	0.00000	0.00000	.00036	.00266	.01340	.00328	.00686	.00725	.00424	41
.00376	.00435	.00318	.00345	.00280	.00382	.00440	.00323	.00725	.00470	
.01034	.01034	.01035	.01034	.01035	.01034	.01035	.01034	.01035	.01034	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	42
.00180	.00134	.00094	.00087	.00068	.00083	.00089	.00073	.00094	.00076	
.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	
.02226	.01138	.00681	.00768	.00003	.00036	.00194	.00007	.00168	.00016	43
.08515	.02516	.02443	.02620	.01787	.02669	.02360	.02133	.03511	.02452	
.07357	.07357	.07358	.07357	.07357	.07357	.07357	.07357	.07357	.07357	
.00361	.00022	0.00000	0.00000	0.00000	.00180	.00117	.00045	.00526	.01769	44
.01570	.00954	.00689	.00640	.00543	.00641	.00778	.00571	.01071	.01210	
.03998	.03998	.03997	.03997	.03998	.03997	.03998	.03998	.03997	.03998	
.00426	.00680	.00529	.01142	.00319	.00258	.00417	.00336	.00474	.00557	45
.01986	.02013	.01695	.02259	.01324	.01792	.01879	.01684	.01736	.01773	
.09375	.09376	.09376	.09376	.09376	.09376	.09376	.09375	.09376	.09376	
.05699	.01343	.02524	.05093	.01792	.03421	.03981	.04848	.04863	.04109	46
.11272	.08969	.08067	.09987	.06807	.08369	.09488	.07456	.10079	.08927	
.64265	.64264	.64264	.64264	.64265	.64264	.64264	.64264	.64264	.64264	
.00495	.00999	.02428	.02342	.00402	.00485	.00675	.00378	.00347	.01049	47
.02666	.01282	.02528	.03304	.02171	.02824	.02427	.02072	.01946	.02443	
.08515	.08516	.08516	.08516	.08517	.08515	.08515	.08516	.08516	.08515	
.03992	.14143	.01439	.02148	.01813	.03178	.03417	.05129	.01927	.02386	48
.10129	.10481	.08196	.08527	.06636	.07971	.08884	.07214	.08667	.08156	
.89617	.89617	.89617	.89617	.89617	.89617	.89617	.89617	.89617	.89617	
.05762	.16231	.08536	.03863	.05118	.03417	.07036	.04314	.04641	.03173	49
.09191	.05477	.07252	.08193	.07456	.09552	.08300	.07140	.08826	.08762	
.20308	.20308	.20308	.20308	.20308	.20309	.20308	.20308	.20309	.20308	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Electrical Appliances	Electrical Industrial Equipment	Communication Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non-metallic Mineral Products
	Industry	33	34	35	36	37	38
33	Electrical Appliances	.00859 1.00082 .01422	.00080 .00067 .01421	0.00000 .00077 .01422	0.00000 .00117 .01421	0.00000 .00054 .01422	0.00000 .00044 .01421
34	Electrical Industrial Equipment	.07578 .00194 .00437	.00181 1.00139 .00437	.00791 .00212 .00437	0.00000 .00171 .00437	0.00000 .00122 .00437	0.00000 .00117 .00437
35	Communication Equipment	.00561 .00730 .01556	.04418 .01139 .01555	.13169 1.02278 .01555	.02975 .00838 .01555	0.00000 .00207 .01555	0.00000 .00266 .01555
36	Other Electrical Products	.00222 .01015 .00825	.07800 .00533 .00825	.00365 .00484 .00825	.01773 1.00536 .00824	0.00000 .00363 .00825	.00799 .00537 .00825
37	Clay, Lime and Cement	.00001 .01011 .01073	0.00000 .00911 .01072	.00036 .00881 .01073	.00088 .00921 .01073	.12904 1.02329 .01072	.03888 .01918 .01073
38	Other Non-metallic Mineral Products	.00107 .00482 0.1638	.01721 .00775 .01637	.01636 .00938 .01637	.00661 .00619 .01637	.01089 .00691 .01637	.18598 1.04615 .01637
39	Petroleum Refineries and Coal Products	.00462 .01383 .07296	.00149 .01268 .07297	.00349 .01605 .07296	.00271 .01823 .07296	.01247 .01428 .07296	.01430 .01660 .07296
40	Plastics and Synthetic Resins	.01662 .00946 .01493	.00372 .00929 .01494	.02208 .01147 .01493	.04178 .01706 .01493	.00141 .00416 .01494	.00270 .01080 .01493
41	Paint and Varnish	.01689 .00507 .01034	.00282 .00399 .01034	.00480 .00429 .01034	.00660 .00536 .01035	0.00000 .00389 .01035	0.00000 .00403 .01034
42	Pharmaceuticals and Medicines	0.00000 .00115 .01671	0.00000 .00086 .01671	0.00000 .00104 .01671	0.00000 .00167 .01671	0.00000 .00107 .01671	0.00000 .00138 .01671
43	Other Chemical Industries	.00129 .04618 .07357	.00082 .02889 .07357	.00075 .04584 .07357	.01343 .07223 .07357	.00277 .02632 .07357	.02036 .04125 .07357
44	Miscellaneous Manufacturing Industries	.00002 .01041 .03998	0.00000 .01053 .03998	.00038 .01016 .03998	.03636 .01942 .03998	.00035 .00854 .03998	.00083 .01051 .03998
45	Construction, Maintenance and Repair	.00266 .01931 .09375	.00231 .01735 .09376	.00257 .01969 .09376	.00244 .02163 .09376	.00667 .02011 .09376	.00638 .01974 .09376
46	Transportation, Storage and Trade	.04377 .09809 .64264	.03475 .08680 .64264	.04020 .09267 .64264	.05516 .11312 .64264	.09994 .10596 .64264	.04457 .10306 .64264
47	Utilities	.00663 .02581 .08516	.00482 .02251 .08515	.00406 .02355 .08516	.00519 .02598 .08516	.01476 .01982 .08516	.03679 .03039 .08516
48	Communications and Other Services	.03438 .09357 .89617	.03439 .08088 .89617	.04651 .08643 .89617	.03841 .10698 .89617	.04028 .10362 .89617	.03384 .09996 .89616
49	Unallocated Sector	.06352 .09196 .20308	.05307 .07720 .20309	.04693 .07681 .20308	.09126 .09321 .20309	.10786 .07941 .20308	.09396 .08382 .20308

Petroleum Refineries and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceu- ticals and Medicines	Other Chemical Industries	Miscel- laneous Manufac- turing Industries	Construction, Maintenance and Repair	Trans- portation Storage and Trade	Utilities	Communi- cations and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	49	
0.00000	0.00000	0.00000	0.00000	0.00000	.00648	0.00000	0.00000	0.00000	0.00000	.00060	33
.00052	.00141	.00059	.00072	.00061	.00139	.00085	.00033	.00025	.00030	.00152	
.01422	.01422	.01422	.01422	.01422	.01422	.01421	.01422	.01421	.01422	.01422	
0.00000	0.00000	0.00000	0.00000	0.00000	.00361	.00578	.00001	0.00000	0.00000	.00499	34
.00115	.00199	.00150	.00196	.00147	.00235	.00097	.00083	.00074	.00088	.00144	
.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	
0.00000	.00272	0.00000	0.00000	.00874	.00334	.01726	.00007	0.00000	.00006	.00369	35
.00307	.01223	.00622	.00061	.00598	.00530	.00484	.00159	.00192	.00209	.00452	
.01556	.01555	.01555	.01855	.01555	.01555	.01555	.01555	.01555	.01555	.01555	
0.00000	0.00000	0.00000	0.00000	.00192	.00914	.01197	.00029	0.00000	.00000	.01379	36
.00336	.00683	.00481	.00632	.00444	.00581	.00305	.00229	.00183	.00224	.00452	
.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	
.00017	.00334	.00130	0.00000	.00083	.00078	.05157	.00005	0.00000	.00013	.00010	37
.00767	.00635	.00465	.00755	.00503	.00575	.01226	.00266	.00478	.00472	.00514	
.01072	.01073	.01073	.01073	.01073	.01072	.01073	.01073	.01073	.01072	.01072	
0.00000	0.00000	.00150	.06813	.00651	.00933	.01114	.00023	0.00000	.00016	.00396	38
.00322	.01309	.00768	.02295	.00832	.00788	.00629	.00186	.00171	.00230	.00607	
.01638	.01637	.01638	.01637	.01638	.01637	.01638	.01638	.01637	.01638	.01638	
.07867	.00370	.00591	.00327	.05005	.00229	.01237	.02095	.00547	.00256	.00111	39
1.03003	.05984	.03276	.01700	.02941	.01843	.01310	.00904	.00557	.00604	.01997	
.07296	.07297	.07296	.07296	.07296	.07297	.07296	.07297	.07296	.07297	.07296	
0.00000	.07576	.05878	.00261	.01104	.10443	.00012	.00028	0.00000	.00003	.00021	40
.00466	1.03939	.02101	.01063	.01245	.03230	.00601	.00287	.00117	.00230	.01458	
.01493	.01493	.01493	.01494	.01493	.01493	.01493	.01494	.01493	.01493	.01493	
.00437	.00505	.05622	0.00000	.00166	.00361	.00532	.00002	0.00000	.00101	.01469	41
.00429	.00761	1.00962	.00655	.00537	.00667	.00323	.00258	.00158	.00215	.00566	
.01035	.01034	.01034	.01035	.01035	.01034	.01035	.01034	.01035	.01034	.01035	
0.00000	0.00000	0.00000	.02995	.01046	0.00000	.00004	0.00000	0.00000	.00098	.00297	42
.00176	.01040	.00529	1.00332	.00394	.00238	.00066	.00070	.00034	.00063	.00178	
.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01672	.01671	
.03993	.63382	.24742	.05534	.17192	.00777	.00308	.00038	.00027	.00248	.02536	43
.06741	.24998	.15449	.05073	1.08284	.13533	.02187	.01435	.00649	.01070	.04552	
.07357	.07357	.07357	.07357	.07357	.07358	.07358	.07357	.07357	.07357	.07357	
.00054	.10548	.00091	.00847	.01155	.08222	.00699	.00125	0.00000	.00168	.02978	44
.00819	.04224	.02311	.01609	.01525	1.03440	.00644	.00547	.00295	.00439	.01346	
.03998	.03998	.03998	.03998	.03998	.03998	.03998	.03998	.03998	.03998	.03998	
.01551	.00388	.00263	.00413	.00796	.00358	.00057	.01850	.05329	.05817	0.00000	45
.03319	.02812	.02283	.02272	.02329	.02011	1.01661	.01378	.01928	.01130	.03784	
.09376	.09376	.09376	.09376	.09376	.09376	.09376	.09375	.09375	.09376	.09376	
.09078	.01387	.04842	.04101	.05874	.03699	.10803	.06559	.01326	.01330	.26928	46
.11775	.16193	.12940	.13803	.12056	.11693	.07858	1.05715	.03642	.04616	.11209	
.64264	.64264	.64264	.64264	.64264	.64264	.64265	.64264	.64265	.64265	.64264	
.00450	.00482	.00323	.00272	.02660	.00556	.00087	.00735	.18251	.00276	0.00000	47
.04142	.04407	.02537	.01848	.02800	.02078	.01554	.00734	1.04395	.00484	.01952	
.08515	.08516	.08516	.08516	.08515	.08516	.08516	.08516	.08516	.08515	.08516	
.00919	.00894	.04591	.07560	.03470	.04410	.04609	.07810	.04369	.08850	.24443	48
.12087	.14025	.12309	.14626	.11332	.11380	.07052	.06163	.04309	1.04826	.15388	
.89616	.89617	.89617	.89617	.89617	.89617	.89616	.89617	.89617	.89617	.89617	
.01140	.02391	.09906	.21527	.09388	.10893	.00742	.07533	.02811	.05086	0.00000	49
.13144	.16946	.11134	.09428	.09747	.09563	.07294	.03524	.02500	.02822	1.13717	
.20308	.20309	.20308	.20308	.20308	.20308	.20309	.20308	.30309	.20309	.20309	

**Table A2 —
Sectoral Classification of the 1965 Ontario Input-Output Table —
Industry Titles and Definitions on the Basis of the Standard Industrial Classification¹**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
1	Agriculture, Forestry and Fishing	011, 013, 015, 017, 019, 021, 031, 039, 041, 045, 047
2	Mining	051, 052, 053, 054, 055, 056, 057, 058, 059, 061, 063, 065, 066, 071, 073, 077, 079, 083, 087, 092, 094, 096, 098, 099
3	Meat and Poultry	101, 103
4	Dairy Products	105, 107
5	Grain Mills	123, 125, 125
6	Biscuits and Bakeries	128, 129
7	Sugar and Confectioneries	131, 133
8	Other Food Industries	111, 112, 135, 139
9	Soft Drinks	141
10	Distilleries, Breweries and Wineries	143, 145, 147
11	Tobacco and Tobacco Products	15, 153
12	Rubber Products	161, 163, 169
13	Leather and Leather Products	172, 174, 175, 179
14	Cotton Yarn and Cloth	183
15	Synthetic Textiles	201
16	Knitting Mills	231, 239
17	Clothing Industries	243, 244, 245, 246, 247, 248, 249
18	Other Textile Mills	193, 197, 211, 212, 213, 214, 215, 216, 218, 219, 221, 223, 229
19	Sawmills	251
20	Furniture and Fixtures	261, 264, 266, 268
21	Other Wood Industries	252, 254, 256, 258, 259
22	Pulp and Paper Mills	271
23	Paper Products	272, 273, 274
24	Printing and Publishing	286, 287, 288, 289
25	Iron and Steel Mills	291
26	Other Primary Metals Industries	292, 294, 295, 296, 297, 298
27	Fabricated and Structural Metals	302
28	Metal Stamping, Pressing and Coating	304
29	Other Metal Fabricating Industries	301, 303, 305, 306, 307, 308, 309, 315
30	Miscellaneous Machinery	311, 316, 318
31	Motor Vehicles and Aircraft	321, 323, 324, 325
32	Other Transportation Equipment	326, 327, 328, 329
33	Electrical Appliances	331, 332
34	Electrical Industrial Equipment	336
35	Communication Equipment	334, 335, 338
36	Other Electrical Products	337, 339
37	Clay, Lime and Cement	341, 343, 345, 347, 348, 351, 352, 353
38	Other Non-metallic Mineral Products	354, 355, 356, 357, 359
39	Petroleum Refineries and Coal Products	365, 369
40	Plastics and Synthetic Resins	373
41	Paint and Varnish	375
42	Pharmaceuticals and Medicines	374
43	Other Chemical Industries	371, 372, 377, 378, 379
44	Miscellaneous Manufacturing Industries	381, 382, 383, 384, 385, 393, 395, 397, 398, 399
45	Construction, Maintenance and Repair	404, 406, 409, 421

¹1960 classification system.

**Table A2 —
Sectoral Classification of the 1965 Ontario Input-Output Table —
Industry Titles and Definitions on the Basis of the Standard Industrial Classification
(continued)**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
46	Transportation, Storage and Trade	602, 604, 606, 608, 611, 613, 614, 615, 616, 617, 618, 619, 621, 622, 623, 624, 625, 626, 627, 629, 631, 642, 647, 649, 652, 654, 656, 658, 663, 665, 667, 669, 673, 676, 678, 681, 691, 692, 693, 694, 695, 696, 697, 699, 501, 502, 504, 505, 506, 507, 508, 509, 512, 515, 516, 517, 519, 524, 527
47	Utilities	572, 574, 576, 579
48	Communications and Other Services	543, 544, 545, 548, 801, 803, 805, 807, 809, 821, 823, 825, 827, 828, 842, 851, 853, 859, 871, 872, 873, 874, 875, 876, 877, 878, 879, 894, 896, 897, 702, 704, 731, 735, 861, 862, 864, 866, 869, 737, 831, 891, 893, 899
49	Unallocated Sector	

Notes

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Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. W. Darcy McKeough, Treasurer of Ontario
and Minister of Economics and Intergovernmental Affairs
H. Ian Macdonald, Deputy Minister

ECONOMIC POLICY
& INTERGOVERNMENTAL RELATIONS

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Ontario Economic Review

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Volume 10, Number 3

The Ontario Economy

1

The Ontario Government and

3

The Pickering Airport Site

Ministry of Treasury, Economics and Intergovernmental Affairs

Selected Economic Indicators

8

A publication of the
Ministry of Treasury, Economics
and Intergovernmental Affairs
Government of Ontario

Hon. W. Darcy McKeough
*Treasurer of Ontario and
Minister of Economics and
Intergovernmental Affairs*

H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Ministry.

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About the Review

While the decision to build a second international airport for the Toronto area was a federal government decision, the government of Ontario played a major role in the process of selecting that site. In order to clarify the nature of that role the Hon. W. Darcy McKeough tabled in the Legislature on June 6th, a collection of Provincial documents compiled during the course of the four-year decision-making process.

The feature article for the May/June issue of the *Ontario Economic Review* is based on two of these documents. The first is a background paper which explains the context in which each of the documents was produced, summarizes their contents and outlines the reasons for the policy decisions that were made at the various stages. The second, which forms an appendix to the article, is the essence of a provincial report which evaluated the proposed airport sites in Beverly Township and Pickering Township according to the impact they would have on the Toronto-Centred Region in terms of: stimulation of growth in the eastern corridor; establishment of a linear arrangement for a system of cities and services and; development of peripheral urban centres such as Port Hope and Cobourg.

The article appearing in this issue was edited for publication by John J. Morning, who departs as editor of the *Ontario Economic Review* and *Ontario Statistical Review* to join the Ministry's Organization Development unit.

Indicator Charts, Pages 8-10

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 8-10 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

While the value of the Canadian dollar continues to rise, the merchandise trade balance again shows marked deterioration. Imports continue to rise more rapidly than exports. In the first four months of 1972 total imports advanced 21.7 per cent, almost three times the 7.3 per cent rate of growth of exports. The deteriorating trade performance is a reflection of two basic factors — a marked increase in Canada's deficit in trade in manufactured products and an overall reduction in foreign demand for Canadian goods.

In merchandise trade during April, Canada imported \$1.51 billion worth of goods, compared to \$1.28 billion in the same month of last year. Canada exported \$1.48 billion worth of goods in April, up from \$1.39 billion a year earlier. The above figures do not include re-exports. When re-exports are included Canada had a surplus and not a deficit in April of this year. The basic figures (before re-exports are included), however, do not indicate a healthy trade situation. If the April deficit continues through May and June, Canada will have its first quarterly trade deficit since the second quarter of 1966 when a \$49 million deficit was recorded. Data for the first quarter of 1972 show a surplus of \$170 million. However, rapidly rising imports and lagging exports have steadily reduced trade surpluses since the high of \$947 million reached in the last quarter of 1970.

The slow growth of Canadian exports increases the difficulty of reducing the relatively high levels of unemployment we are currently experiencing. A continuous expansion of sales to other countries is needed if the number of new jobs in Canada is going to keep up with the number of people entering the labour force.

Aggravating the difficulties in export efforts is the continuous upward pressure on the Canadian dollar. On June 7, the dollar strengthened to a closing value of 102.34 cents (U.S.) — the highest the dollar has traded since the latter part of 1960. The dollar has risen by almost three per cent since the beginning of the year, when it was trading at approximately 99.5 cents (U.S.). The recent strength in the Canadian dollar reflects a variety of developments, including a general weakness of the U.S. dollar in international currency markets, increased borrowings abroad by the provinces, and the attraction of foreign investment capital because of Canada's relatively strong economic performance. Significant to this development are the

much higher short-term interest rates in Canada than in other major industrial countries and in the Eurodollar market. This factor, as well as speculation that the Canadian dollar will rise further has caused an inflow in the past few months of short-term capital which has been reflected in the rise of the trading value of the Canadian dollar.

The Bank of Canada is reported to be following a middle-of-the-road approach, attempting to hold down the value of the dollar or at least slow its rise, while endeavouring to moderate the growth in money and credit in the economy. It has not been too successful in this approach so far, as the dollar has appreciated significantly and the growth of the money supply has continued at a high 18 per cent at annual rates. The Bank of Canada is faced with the problem of trying to hold down the rate of exchange. To do so, it must supply large amounts of money to the economy. This would encourage inflation which some economists fear already poses a serious threat to economic stability in Canada throughout the rest of the year.

Statistics Canada data also reveal increasing reliance upon the United States. Canadian exports to the U.S. have increased and Canada maintains a surplus in merchandise trade with that country, but exports to other countries are running below last year's levels. The latest figures also show that the United States is reducing the trade deficit with Canada. Imports from the United States were \$1,067.0 million in April, up from \$926.9 million in April, 1971. Canadian exports to the United States rose to \$1,100.8 million from \$986 million over the same period. By comparison imports from the U.S. rose by \$142 million while exports were up only \$114 million.

The increase in sales to the United States has been a major factor in keeping Canada's total export figure on a rising trend. However, with imports from the U.S. going up at a much faster rate the result has been that the United States has steadily taken a larger share of Canada's overall trade. Several sources have advanced the argument that such a large portion of its trade with the United States ties Canada closer to that country than does ownership of Canadian firms by U.S. interests. The heavy trade leaves Canada vulnerable to U.S. governmental actions, such as the imposition of an import surtax, in a manner unequalled by the ownership of Canadian firms.

The increase in the tempo of domestic economic activity has contributed to the expansion in imports, whereas exports suffered from the slowdown in some overseas countries and the unusually severe winter which particularly influenced wheat shipments. Exports to the U.S., however, rose as the economy there appeared to be moving into a period of more rapid expansion.

In addition, there has been a shift in the trade position in motor vehicles and parts. In the first quarter, there was a motor vehicle deficit of \$60 million, compared with a \$50 million surplus in the first quarter of 1971. The surplus in motor vehicle trade with the United States declined to \$59.7 million from \$102.5 million over the same period. Statistics Canada reports that the declining surplus resulted mainly from increased imports of parts. The deficit with other countries widened by approximately \$67.0 million mostly from increased imports of vehicles.

Index of Industrial Production

The Canadian index of industrial production moved ahead in April after very small advances in the first quarter of the year. Data recently released by Statistics Canada show that the index rose to 188.3 in April, up 2.1 per cent from 184.4 in March. The March level was unchanged from February, and there was only a gain of 0.3 per cent in January and February. The index is based on 1961 output of manufacturing, mining and electric power, gas and water utilities.

The report for April showed strong gains in both durable and non-durable goods manufactured, which combined account for about one-quarter of Canada's total output. Durable goods output, led by a 10.3 per cent gain in production in the wood industries, rose by 3.1 per cent. Non-durable manufacturing was up 2.1 per cent. Mining production increased by 2.0 per cent largely due to a 4.2 per cent increase in output of the metal mines. Only electric power, gas and water experienced a decline.

The index of industrial production measures approximately one-third of Canada's total output, and its three principal components (manufacturing, mining and the utilities) are those which most readily reflect rises or declines in the cycle of business activity. The index measures the physical volume of output in Canada exclusive of any increase in value due to price rises. The data is adjusted to eliminate seasonal fluctuations which result from high production in the

summer months and reduced output during the winter slowdown.

All components of the durable goods segment rose with the strongest gains being made in transportation and equipment, electrical products and non-metallic mineral products, as well as wood industries. Demand for durable goods is usually regarded as a good indication of underlying strength or weakness in the economy. Demand for non-durables, such as food, clothing and fuel, tends to remain more constant. Output of the petroleum and coal products industries, however, rose 8.0 per cent last month. Food, tobacco and rubber industry output rose between two and three per cent.

Gross National Product — First Quarter 1972

Statistics Canada has released preliminary estimates of the National Income and Expenditure Accounts which indicate continued growth in the nation's output of goods and services in the first quarter of 1972. Little change is evident in the overall rate of increase in prices and the growth pattern was similar to that in the fourth quarter of 1971. An outstanding feature of the first quarter, was a sharply rising rate of inventory investment.

Gross national product at market prices is estimated to have risen by 2.2 per cent or \$2.1 billion to a level of \$98.7 billion seasonally adjusted at annual rates. This compares with a 2.1 per cent increase in the fourth quarter of last year. After discounting a rise of 1.1 per cent in the overall implicit deflator, the volume of production is shown to have risen by 1.0 per cent — a similar pace of advance as that of 0.8 per cent shown by the revised estimate for the fourth quarter of 1971. The previously released estimate had shown a stronger fourth quarter.

Domestic demand (GNP plus imports less exports) continued to increase and to outpace production, resulting in an unusually large increase in the deficit in the balance of transactions with non-residents. Consumer outlays again posted a good gain, despite a fall in new automobile purchases. Housing construction, which has also been a major sustaining force in previous quarters, continued to advance. An important source of strength in the quarter was the increase in non-farm business inventories, which showed the largest accumulation since the fourth quarter of 1969. On the other hand, fixed capital formation, excluding housing, and exports were sluggish in the first quarter, in line with the perform-

Estimates of Population, Canada and Provinces (Thousands)

	Estimated Population		Census June 1, 1971	Per Cent Increase Since Census
	April 1, 1972	Jan. 1, 1972		
CANADA	21,788	21,731	21,569	1.0
Newfoundland	530	528	522	1.5
Prince Edward Island	113	112	112	0.9
Nova Scotia	793	793	789	0.5
New Brunswick	642	640	335	1.1
Quebec	6,056	6,047	6,028	0.5
ONTARIO	7,800	7,777	7,703	1.3
Manitoba	991	989	988	0.3
Saskatchewan	917	919	926	-1.0
Alberta	1,650	1,644	1,628	1.4
British Columbia	2,241	2,227	2,185	2.6
Yukon	19	19	18	5.6
Northwest Territory	36	36	35	2.9

Source: Statistics Canada, Daily, June 2, 1972.

ance displayed in the second half of 1971. Government current expenditure on goods and services rose at a substantially lower rate than in the previous three quarters.

Consumers increased their outlays on goods and services by 2.1 per cent or \$1,188 million. This represented a little over half of the total increase in the value of production. The rate of increase in the fourth quarter of 1971 was 2.6 per cent. The somewhat lower rate of growth in the first quarter was entirely due to reduced expenditure on new cars, down 8.6 per cent after an exceptionally strong performance in the four previous quarters. Excluding new cars, personal expenditure rose by 2.9 per cent compared with 2.4 per cent in the fourth quarter of 1971.

The current boom in housing construction, which started in mid-1970 and continued throughout 1971 was still evident in the early months of 1972. In the first quarter, the value of work put in place, which reflects new starts during the quarter and the backlog of construction started in previous periods, rose by 5.5 per cent to reach a level of \$5,028 million. The number of units started — in excess of 262,000 — was one of the largest on record. Starts were concentrated in single houses, which have a larger value on average than duplexes and apartments, thus accentuating

the increase in the value of work put in place. The value of investment in single units rose by 17.7 per cent — the largest quarterly gain in the past decade.

Population — April 1972

A recent Statistics Canada report estimates the population of Canada as of April 1, 1972 at 21,788,000. This was an increase of 219,000 or one per cent since the June 1, 1971 Census and 57,000 in the first quarter of 1972. Ontario had the largest increase — 97,000 — since the Census and British Columbia the greatest percentage growth — 2.6 per cent. At the present rate of increase the 22,000,000 population level will be reached by January 20, 1973. The basis of these estimates is the population count of the Census of June 1, 1971. As of noon, June 2, the estimated population of Canada was 21,810,485.

The elements in population change for the period since the Census of June 1, 1971 were: one birth every one minute and 27 seconds; one immigrant every four minutes and 29 seconds; one death every three minutes and 17 seconds; one emigrant every nine minutes and 15 seconds; one population increase every two minutes; each day's increase equals 720 persons.

The Ontario Government and The Pickering Airport Site

Ministry of Treasury, Economics and Intergovernmental Affairs

The Ontario government's involvement in the decision to build a second international airport at Pickering has, from the outset, been characterized by two basic concerns. One concern has been to make certain that the needs of air passengers travelling in and out of the Toronto region would be safely and conveniently cared for by whatever facilities might be built to supplement or replace the existing facilities at Malton. The other concern has been to make certain that such additional facilities would make the maximum possible contribution to the broader well-being of the Toronto-Centred Region, notably its rational and orderly growth and development.

In arriving at the decision announced last March 2nd, the provincial and federal governments co-operated in a long and complex process which consisted basically of examining the broadest conceivable range of options, and then systematically narrowing these options, step by step, down to the final, most suitable choice.

As the main body of this paper will relate in greater detail, the decision-making process followed this sequence:

1. The need for additional air transportation facilities for the Toronto region was thoroughly established by federal studies initiated in the mid-1960's.

2. The federal government announced its decision to meet these needs by expanding Malton airport.

3. The federal government revoked this decision because such expansion would cause too much disruption of the surrounding community. Assured that Malton would not be expanded, the provincial government introduced certain land-use controls over the surrounding area, to ensure that its growth and development from then on would be compatible with Malton's operations.

4. A federal-provincial task force began searching for a site that would become the location of *the* major international airport serving Toronto.

5. The search was narrowed down from 59 sites to four sites, and the four were analysed in detail and compared with Malton.

6. Studying these analyses, the two governments decided that none of the four sites met the necessary criteria already laid down.

7. Consequently, the basic problem was reviewed, the original terms of reference were abandoned, and the task force began instead to search for a site to complement

Malton in a two-airport or multi-airport system.

8. Within these new terms of reference, two "new" sites (Pickering and Beverly) were identified and carefully compared.

9. The Pickering site alone was found to satisfy all technical and other criteria, including the potential to further the objectives of the Toronto-Centred Region plan.

10. The choice of the Pickering site was announced simultaneously by the two governments.

This paper does not purport to relate the history of that decision in its entire detail. Rather, it is intended to complement and interpret the technical reports and other documents which were written at various stages of the decision-making process.

Although this process was thorough and logical, the complexities of the project were such that, in many points in time, several studies and processes were proceeding simultaneously and were having some influence on each other. For instance, while one provincial group was producing the proposals contained in "Design for Development: The Toronto-Centred Region", a separate provincial team concerned specifically with the location of a new airport was compiling a 1970 submission to the federal government. Each team, however, was aware of the other's findings, and the Toronto-Centred Region report influenced the content of the airport submission, even though the latter, as it happened, appeared a month before the former.

In spite of many such simultaneous or overlapping studies, the history of the airport decision can be related as follows:

As a result of a study begun in 1966, the federal government announced in 1967 that it intended to expand Malton airport to meet the future air transportation needs of the Toronto area.

In December 1968, the federal government decided that the proposed major expansion of Malton airport to accommodate traffic to the mid-1980's and beyond was unacceptable, in view of the large-scale disruption that such expansion would cause. It was demonstrated that some 35,000 people were already affected by noise from flight operations and that the proposed expansion of Malton would subject an *additional* 35,000 people in existing residential communities to this noise.

Assured that Malton would not be expanded, the Ontario government introduced

land-use controls in the noise area to make sure that any growth around the airport would be compatible with flight operations from Malton as it existed.

In announcing the controls, the Honourable W. Darcy McKeough, then Minister of Municipal Affairs, said in a public statement that they represented "the first comprehensive attempt by any jurisdiction in North America to ensure that the utilization of lands in the vicinity of an airport would be compatible with the high noise levels generated by aircraft operations". Since these controls were announced, some 25,000 people have moved into areas which are not controlled and which would be affected by noise if Malton were expanded.

Soon after, a federal-provincial task force was formed to seek an alternative site as *the* major airport for Toronto, to be operative about 1980. Malton would be confined to handling its existing volume of traffic.

Federal experts initiated this search by identifying 59 sites within a 50-mile radius of Toronto. Purposely, it was a rough first list, designed to identify any site that could become a major six-runway airfield.

Next, the task force set about reducing this list to a few sites, eliminating the others on grounds of safety, operational considerations involving navigational aids, aircraft and air traffic control equipment, ground access problems, existing flight paths, weather, disturbance to heavily built-up urban areas, and so on.

By this process, the list was reduced to four sites: Lake Simcoe, Lake Scugog, Campbellville (Guelph-Kitchener) and Orangeville, which were to be analysed in depth. As part of this analysis, the Ontario government commissioned a study entitled, "Regional Impact of a New International Airport for Toronto". Published in March, 1970 for internal government use, this report was the work of a consultant, Gerald Hodge, who had been commissioned by the government and had considerable support from the province's regional development staff in preparing the report.

The Hodge Report, like several that followed it, is too technical and too detailed for brief summary here. However, two significant points about it should be noted. First, Hodge forecast the annual flow of air passengers through Toronto would reach 54 million by the year 2000 (a figure roughly in line with the federal estimate). Experts from both governments agreed that this

¹Background Paper tabled in the Ontario Legislature by the Hon. W. D. McKeough, Minister of Treasury, Economics and Intergovernmental Affairs, June 6, 1972.

would be far too many passengers to be served by Malton's facilities, which were then handling 5.3 million per year.

Secondly, Hodge set out his views on the pros and cons of the four sites then under consideration as eventual replacements for Malton airport and rated Orangeville and Lake Scugog highest.

The Hodge study, combined with the findings of three other studies commissioned by the federal government, were summarized in a provincial document of April 1970 entitled, "Submission to the Government of Canada in Respect of the Location of the Second International Airport for the Toronto Region".

As this report said, "None of these studies were (sic) required to provide conclusions or recommendations for any particular site but only to provide a detailed data analysis of each site's potential . . ."

The report, dated April, 1970, set out criteria designed to facilitate consideration of the options and to enable policy decisions to be made on the basis of comparisons between sites.

Using the four technical studies as the basis of its judgment, this report made these observations:

Costs to various levels of government: Lake Simcoe would involve by far the highest cost. Among the other three sites there would be "no significant difference".

Costs to users of the air terminal: Campbellville (i.e. Guelph-Kitchener) would cost considerably less than the others — to the extent of \$1 billion over 30 years.

Social, ecological and environmental disruption: Lake Simcoe would present "significant destructive influences" and would be "particularly harmful to the recreational potential of the Toronto region". There were "no significant differences" between the other three, Campbellville (Guelph-Kitchener) was the poorest choice of these three.

Benefits to the region's long-range development: Lake Scugog and Orangeville sites were best. Campbellville had "some significant disadvantages"

This report, offering such evaluation rather than a firm recommendation, said that there had to be a trade-off between alternative advantages and that the choice of site would depend on a policy decision on how much weight would be given to various criteria.

In mid-1970, federal-provincial discus-

sions at the ministerial level intensified. From the federal point of view, none of the sites was technically excellent and some had significant drawbacks. Meanwhile, the Ontario government had misgivings about the same sites in relation to its Toronto-Centred Region plan. In its plan, entitled, "Design for Development: The Toronto-Centred Region",² the Ontario government called for measures to encourage a relatively heavier increase in the population to the east of the city. Observing that "Malton will continue to exert an enormous influence on the shape of the region", the report added:

"The location of a new international airport to service southwestern Ontario would be of most crucial significance to the future spatial pattern of the Toronto-Centred Region. An airport will bring with it, into an immediate impact area, in excess of 120,000 people with public and private investment in excess of \$3 billion. Furthermore, since a new airport will require highly efficient transportation routes between itself and Malton, a new corridor for potential development will be created. The integrity of the development concept requires that a site be chosen which does not add such a powerful magnet for development in a location which conflicts with strategic components of the plan."

Because of the doubts being expressed about all four external sites, an internal review was taken in the Ontario government of the feasibility of having Malton handle all air traffic until the year 2000. Population estimates for the area were brought up to date and studies were conducted of the problems of expanding the airport ("Toronto Airport Location — Proposed Malton Expansion") and of the associated question of providing sufficient ground transportation to serve the airport.

Within the limits of its own assumptions, the study on expansion of the airport appeared to offer a practical solution to the whole problem. It showed, to no one's surprise, than expanding Malton would cost 35 to 65 per cent less than building a major six-runway airport at any of the other four potential sites. (The Pickering concept, far less expensive than those four other sites, had not yet been costed out.) "The savings in primary capital costs alone are \$400 million," the report said. It conceded that Malton would generate more ground traffic than could be handled by all highways then

existing or planned, and that the highways still in the planning stage were at the practical limit of 16 lanes. However, the report suggested that the ground transportation problem could be solved by a system of mini-terminals away from the airport site. These could be connected to the airport by a rapid-transit system built especially for the purpose.

Conceding another set of major difficulties that expansion would bring about, the report noted that "the political history of the expansion of this site is such as to suggest that further encroachment on urban land, further increases in noise and air pollution and further risk of safety hazards is socially unacceptable in this area." (What it might have added was that by then the unrestricted area around Malton was even more densely built up than it had been when objections to expansion were voiced in 1968.)

To overcome these "socially unacceptable" difficulties, the report warned that stringent technical controls would be needed to prevent any further spread of noise and air pollution, as well as "strong control of servicing and subdivision approvals" to hold the population down to existing target figures.

The report also conceded that expanding Malton would encourage the very population shift that the Toronto-Centred Region plan was designed to reverse; but it argued again, that strong government controls could restrain this trend.

Ontario government leaders read this report and decided that its proposition was based on too many risky assumptions. It assumed that a number of major untested and undeveloped technological advances in rapid transit, noise abatement and pollution control would all become practical realities by the time expansion was completed.

If that assumption proved wrong, thousands of people who had recently moved into the Malton area, on the assurance that the airport's adverse effects would not touch them, would suffer from noise and air pollution.

The report also assumed that the measures proposed by the Toronto-Centred Region plan could be modified drastically enough to overcome the added impetus for a population build-up west of the city.

Ontario government leaders looked hard at those assumptions and rejected the report's proposals.

Now the search for a solution to the airport problem had reached a point where

²Ontario Economic Review, July-August 1970, Vol. 8, No. 4, pp. 3-13.

none of the alternatives at hand were considered satisfactory.

It was therefore decided to review the issue and see what modifications might be considered. A Summary Report on Status of Airport Planning was prepared for the Ontario Cabinet and this outlined the following options:

1. Expand Malton only.
2. Build a major airport elsewhere and let Malton handle only the short-haul flights.
3. Expand Malton, purchase a landbank at one of the other sites and develop the later into an airport only if Malton proves unable to contain its noise and air pollution.
4. Expand Malton and develop a system of regional airports with Malton having a central, long-haul role.
5. Close Malton in the early 1980's and meanwhile develop a new airport elsewhere.

The report recommended a combination of these alternatives involving a moderate expansion of Malton beyond the current Phase II, together with the development of a major eastern airport site as soon as possible.

The approval of this decision meant there was to be not just a single airport but a system of airports. The second airport, wherever it might be, did not have to meet the stringent requirements set out for the original four sites. The task force was then able to recommend consideration of two new sites: Beverly Township, in the southwestern sector of the region, and Pickering Township, in the northeast. Federal authorities looked at the new contenders and agreed that both were technically feasible for airport operations.

The selection of the two new sites developed logically from the studies of the previous three years, and from the new criteria. It was most desirable to pick sites that fitted into the regional transportation systems and were strategically placed to serve the market. None of the original four sites met these new requirements.

In addition, either of the two new sites would be less costly to build and less costly to use than any of the original four.

In October 1971, a provincial report entitled "Review of the Proposed Airport Sites

E and F — Regional Development Plan"³ evaluated the two sites according to the impact they would have on the Toronto-Centred Region.

It warned that, partly because of "the power of an airport to focus growth", selection of the Beverly site would "detract from the effectiveness of government measures to stimulate growth and services east of Toronto" and might cause problems of absorbing growth in the nearest cities.

The report suggested that if inauguration of a major western airport could not be prevented outright, it should at least be delayed until development east of Toronto had gained momentum.

The Pickering site, the report went on, "on the other hand partly satisfies the requirement for general economic stimulus in the eastern corridor, but falls short to an extent which may have the effect of stimulating growth in and adjacent to eastern Metropolitan Toronto, rather than in and near Oshawa, as desired".

The report also singled out noise and ground transportation as potential problems in Pickering. But in its summation, the report left no doubt that Pickering was considered by far the better choice for the airport site. In a numerical summary of the criteria considered vital, Pickering scored seven points to Beverly's four.

Meanwhile, a report called "Ground Transportation Review of Sites E and F" suggested that local transportation problems at the southwestern site were not nearly so severe as at the northeastern site. However, the northeastern site, it said, provided the greatest capability for both highway and mass transit access. A major transportation facility for the southwestern corridor would be much more difficult to accommodate.

Environmentally, there were pluses and minuses on both sides, but not evenly so, as a report from the Ontario Department (now Ministry) of the Environment showed, in February 1972.

This report, entitled, "Proposed Toronto Airport II: Environmental Impact Study" only rated the Beverly Township site a more desirable choice for the airport on one count: the soil there is less fertile than in Pickering; hence soil damage in Beverly would be a less significant loss. But on 16 other en-

vironmental points, Pickering proved the better choice. Beverly's farms are more modern and successful than Pickering's — many of which are vacant or in need of repair. As far as the effects on drainage systems, water tables and water quality are concerned, Pickering would either suffer less — or have less to lose. The same is true of the impact of natural vegetation (Pickering has no natural woodlots; Beverly has), on fishing (many Pickering streams are posted against it anyway), on hunting (Pickering has no game animals to speak off) and on ecological inter-relationships (Pickering's are less complex, hence less susceptible to disruption).

With such strong environmental arguments going for it, and with the added prospect of giving the Toronto-Centred Region the right economic stimulation in the right place, Pickering became the choice — not just for the airport itself but also for an adjacent community for which the province now plans a population of 150,000 to 200,000.

Prior to the determination of the new Pickering airport, the Toronto-Centred Region plan called for development of a number of new communities in a northeastern tier paralleling the lakeshore. Cedarwood, Brock and Audley were proposed for development starting in the 1980's. This growth strategy required transportation corridors, transit facilities, water, sewerage and other community services.

The development of an airport complementary to Malton, at the North Pickering site, will not create new unplanned urban development. The decision did require some modification of the original arrangement of the communities and some changes in the timing of services. North Pickering Community takes into consideration the possible runway alignments and the noise from the airport. The opportunity it provides is being taken to bring about a more exciting and attractive city. The new airport provides the stimulus for development in this area and at the same time assists in diminishing growth pressures west of Toronto.

These changes do not represent a departure from the growth strategy for the Toronto-Centred Region. The decision is a major step in its implementation.

³See Appendix.

TCR STRATEGIES USED TO REVIEW PROPOSED AIRPORT SITES E AND F⁴

One of the main goals of the Toronto-Centred Region Concept is to "increase the level of opportunity" for residents of the eastern and northern sectors of the Region. In this sense "opportunity" is the notion of access to medium and high order activities, services and functions.

Towards achieving this goal — "increase the level of opportunity" — the concept involves the relevant strategies of:

Strategy 1 — *Deflection to and stimulation of growth extending from the boundary of Metropolitan Toronto to Bowmanville, focussed on Oshawa.* Growth of the Toronto Region has tended to be westward and congested, and has not proceeded at the same tempo in the underdeveloped eastern corridor. Comparatively speaking the smaller centres of the eastern corridor do not provide the same level of opportunity as is available in the western corridor.

Strategy 2 — *Linearity which seeks as far as possible to align urban places and activity nodes along a series of more or less straight paths to take maximum advantage of super-imposed demand for transportation and services.* The linear arrangement would generate sufficient traffic to make workable a highly sophisticated transportation system, thereby increasing the level of aggregate opportunity within the system of cities along this spine.

Strategy 3 — *Decentralization to develop peripheral urban centres such as Port Hope/Cobourg.* Growth will increase the range of services available in these centres and increase the level of opportunity to their hinterland.

IMPACT ANALYSIS OF AIRPORT SITES E AND F

Each of the sites is evaluated from the point of view of its impact upon achievement of the above strategies.

Site F (Brock City)

The selection of the site effectively preempts the sub-regional centre of Brock City from the two-tiered system of cities. The loss of this centre does not substantially alter the concept; however its selection does have varying degrees of impact upon the three strategies:

Strategy 1 — The location of the Airport at site F would generally be a positive factor in the stimulation of growth in the eastern corridor. However, the magnitude of this stimulation is tempered as the selected site does not assist fully in the establishment of the dominance of Oshawa. It is anticipated the primary residential impact will fall on the adjoining centres of Cedarwood, Pickering, Audley and Ajax and the industrial impact on East Metro. As well, the prospect of stimulation of such undesirable Zone 2 centres as Markham and Stouffville (Century City) is raised again.

The airport location at F partly satisfies the requirement for general economic stimulus in the eastern corridor, but falls short to an extent which may have the effect of stimulating growth in and adjacent to Metropolitan Toronto, rather than in and near Oshawa, as desired.

The goal here is to move Oshawa ahead as soon as possible in order to establish quickly the medium and higher order activities there and then subsequently stimulate growth in Ajax, Audley and Cedarwood. If growth is delayed at Oshawa, places like Cedarwood and Audley will establish their affinities with Metropolitan Toronto rather than Oshawa. In this regard, Site B (Lake Scugog) is acceptable.

Strategy 2 — Site F generally supports the notion that all regional generators and attractors should be on line and therefore well interconnected. Site F is acceptable in this regard as long as the transportation interchange between the regional public system and the airport public circulation system is at the southern extremity of the site.

Strategy 3 — Site F provides more convenient access than Site E for long-haul service for Port Hope/Cobourg and Peterborough/Lindsay. However, it is not as favourable as the combination of Malton and Site B. An airport at Site F, with these user benefits, would positively foster decisions to locate at Port Hope/Cobourg and consequently assist the achievement of Strategy 3.

Other Observed Constraints and Opportunities

The utilization of Site F will have an effect upon the site locations of six regional activities:

- The site for the new City of Brock will be completely used by the Airport (Brock

City site and Site F are virtually coincident).

- HEPC's proposed 500 K.V. lines on a N/S alignment along the west side of Duffins Creek, plus an E/W alignment immediately South of Claremont as well as a proposed transformer site south-west of Claremont, all would have to be re-located.
- The C.P.R. Peterboro Subdivision would have to be relocated which may create the opportunity to directly serve Site F. However, a slight northerly relocation of the C.P.R.'s Oshawa Subdivision would more advantageously serve Site F as it then would be "on line" of the second principal service-activity spine of Zone 1.
- Would impair public enjoyment of the important recreation/conservation elements of the mini-belts separating Cedarwood/Brock/Audley.
- The runways on Site F are positioned so that much of the flight path traverses the Parkway Belt. The proposed southerly E/W runway would create overflying of proposed second tier Audley City Centre.
- Added stimulation by the Airport could cause a northerly migration of the Zone 1 boundary at Brock, Audley, etc.

Site E

Site E, which is located west of Hamilton, is generally compatible with plans for structuring the western sector of TCR. However, it detracts from expansion policies for the eastern corridor.

Strategy 1 — As stated above, Site E competes directly with the provincial strategy to stimulate growth within the eastern corridor. Additional growth potential here aggravates the servicing problems caused by rapid growth rates to the west of Metropolitan Toronto. It diminishes the opportunity for achieving a more balanced growth between areas east and west of Metropolitan Toronto. As far as strategy achievement is concerned, capital spent for facilities in the eastern corridor is more productive.

Strategy 2 — Site E can be serviced by an extension of the principal spine of Zone 1, rendering it fully "on line". In this regard, Site E is a better westerly candidate than either Sites C or D (Campbellville or Orangeville).

Strategy 3 — The stimulus of an airport is not needed in the western area, as both

⁴Extract from "Review of Proposed Airport Sites E and F — Regional Development Plan" tabled in the Ontario Legislature by the Hon. W. D. McKeough, June 6, 1972.

Hamilton and Kitchener/Waterloo are already beyond the lower threshold of self-sustaining development.

Potentially, the westerly extension of the second tier spine intersects with the evolving Kitchener/Waterloo/Hamilton/St. Catharines spine at Site E, creating a location with premium accessibility qualities. Development may gravitate to this location and thus compete with the location of higher order activities at Hamilton, a TCR regional-terminal centre.

Other Observed Constraints and Opportunities

The utilization of Site E will have an effect upon the site location of three regional activities.

- The major positive consideration of Site E is that it is compatible with plans for physical structuring of the western sector of TCR.
- The Niagara Escarpment is an effective edge to delimit urban development. Site E, within close proximity to the Escarpment, and sheltering behind it, reduces the chances for a repetition of the Etobicoke experience.
- It is possible that Site E is in conflict with HEPC's plans for a 500 K.V. Line connecting Nanticoke to the Galt/Guelph/Kitchener/Waterloo complex.

Comparative Summary of Site Impact upon TCR Strategies

Strategy	Site	E (West of Hamilton)	F (Brock City)
1	Eastern Stimulation	1	3
2	Linearity	2	2
3	Peripheral Centres	1	2
Total		4	7

LEGEND: Weights To
Subjectively Measure
Strategy
Compatibility

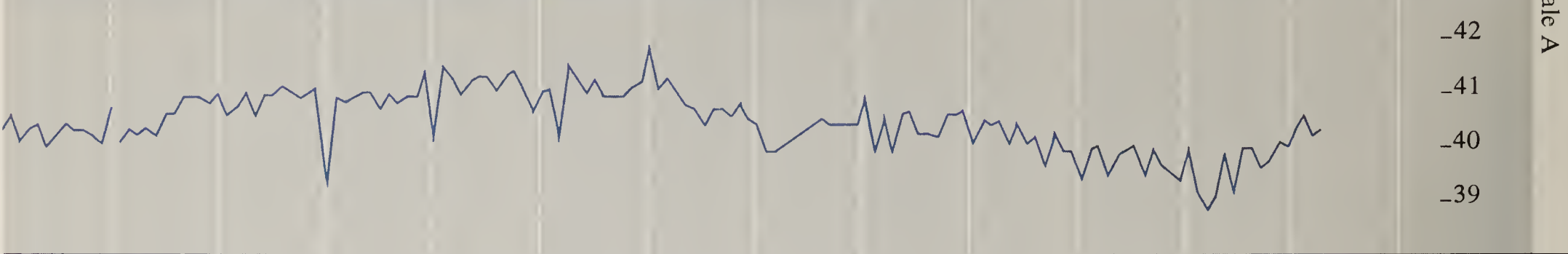
Good - 3
Fair - 2
Poor - 1

Based on the above subjective evaluation, Site F best complements the three selected strategies which together help achieve the primary TCR goal to increase the level of opportunity for future residents of the eastern and northern corridors.

Selected Economic Indicators

Leading Indicators

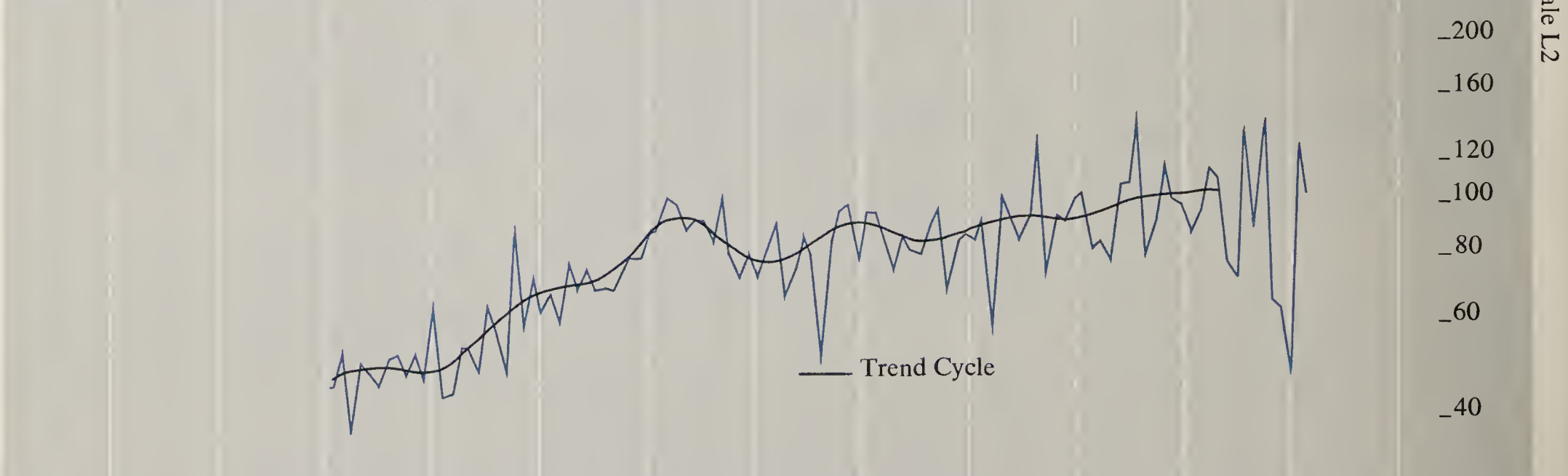
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



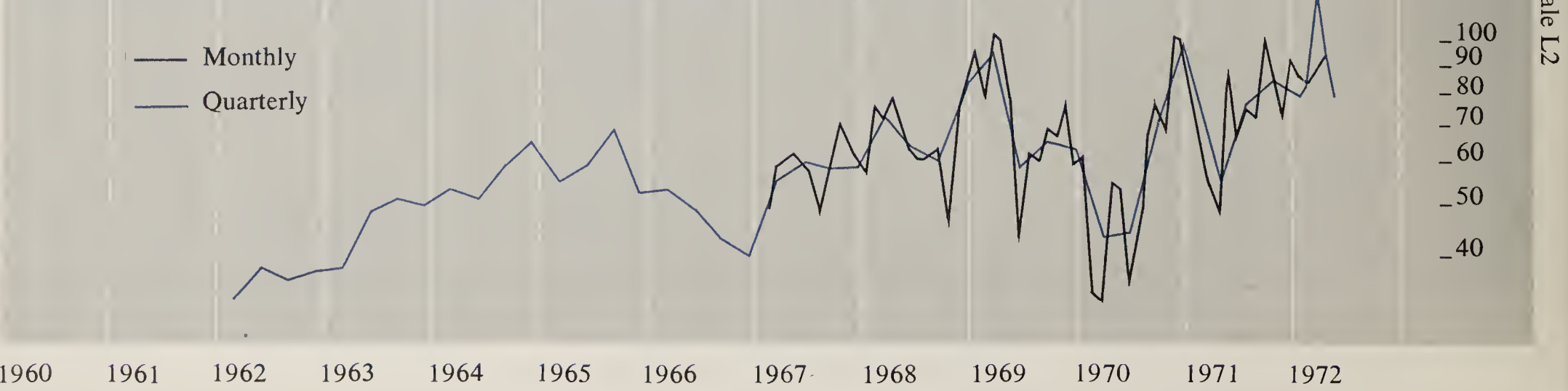
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



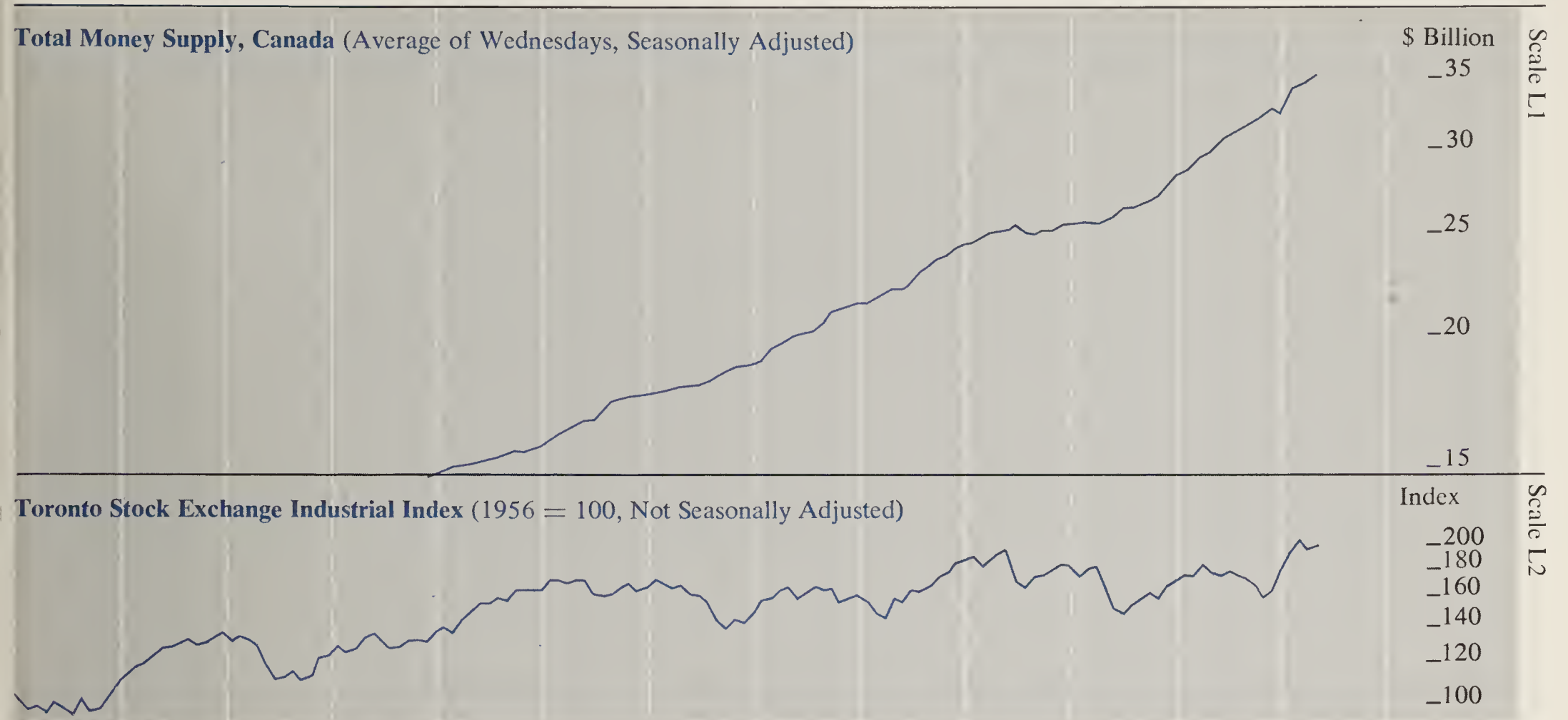
Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



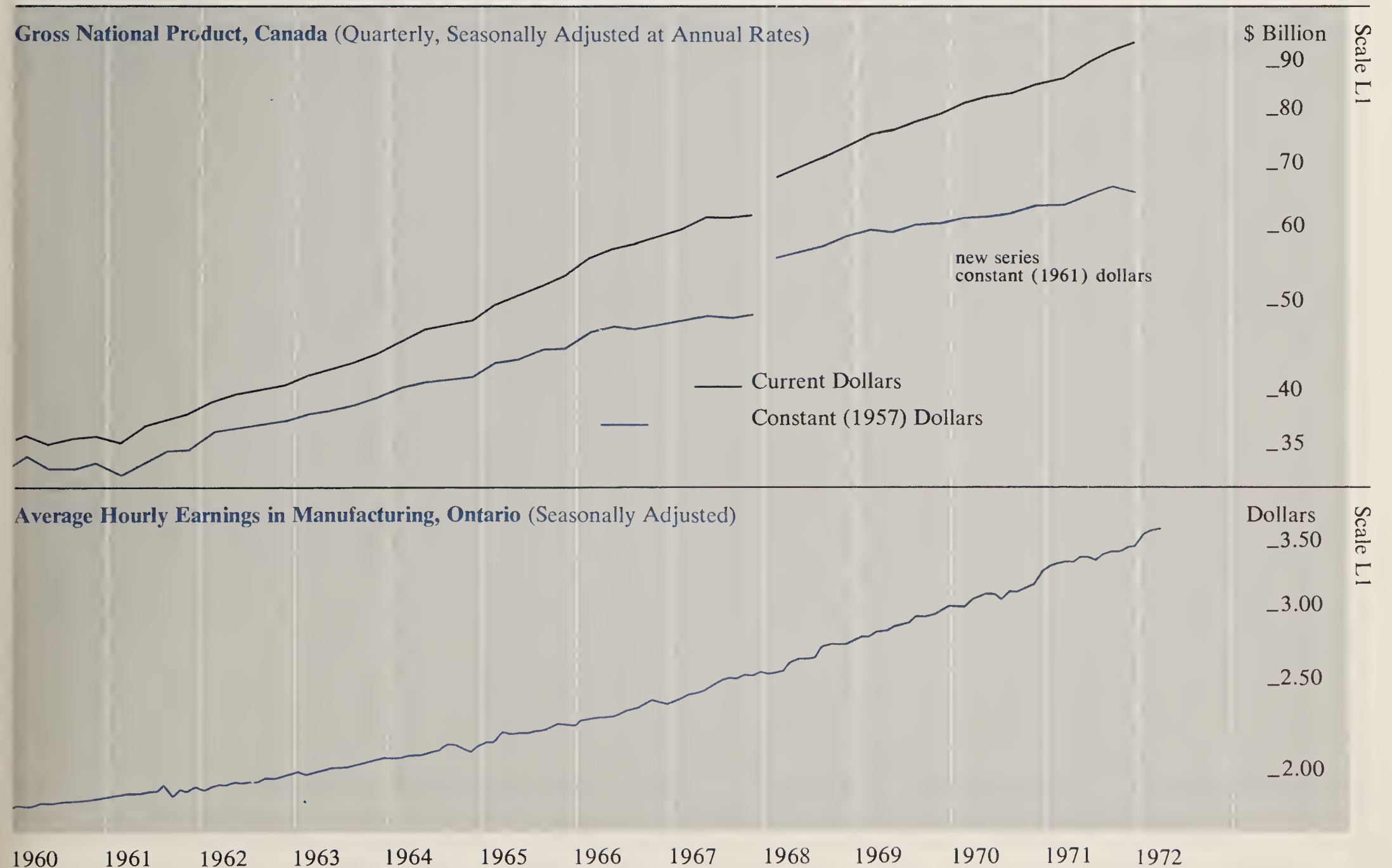
Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Leading Indicators

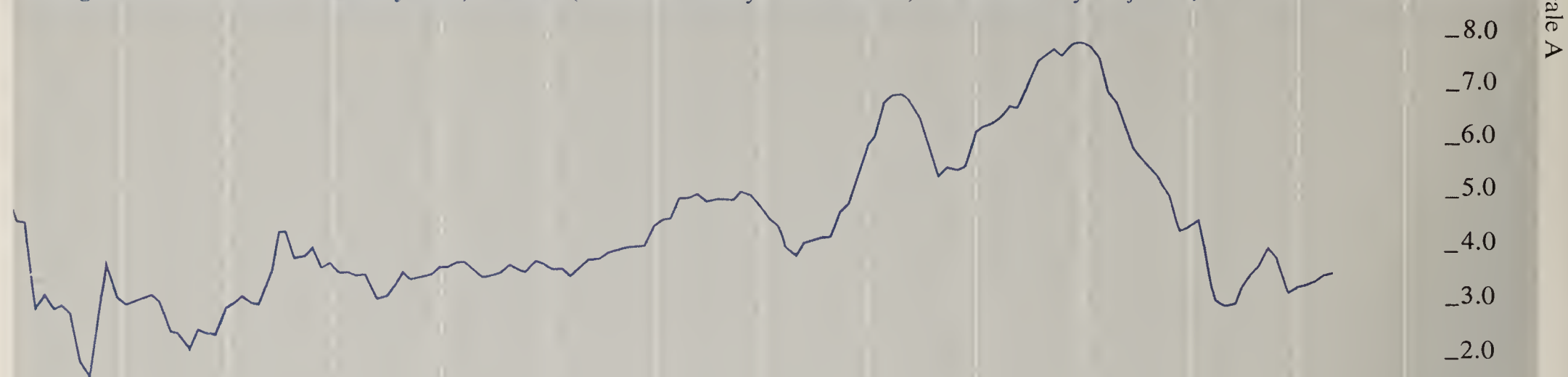


Coincidental and Lagging Indicators

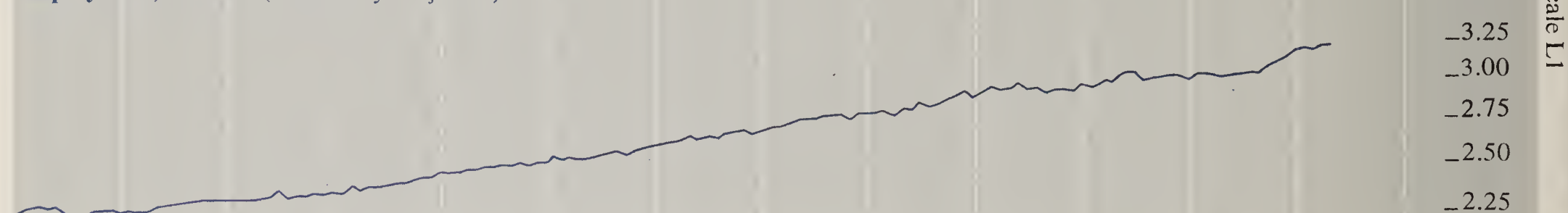


Coincidental and Lagging Indicators

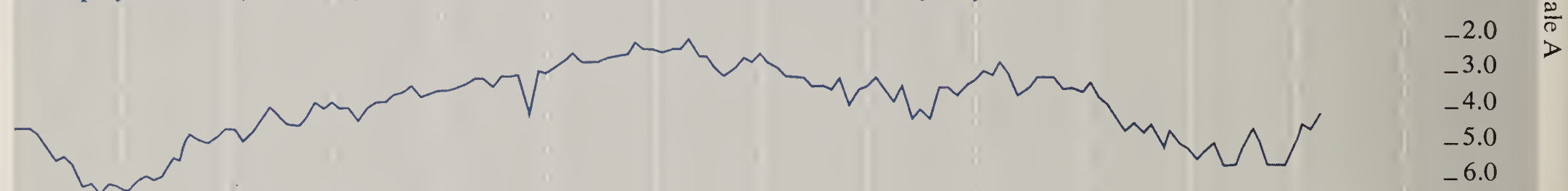
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



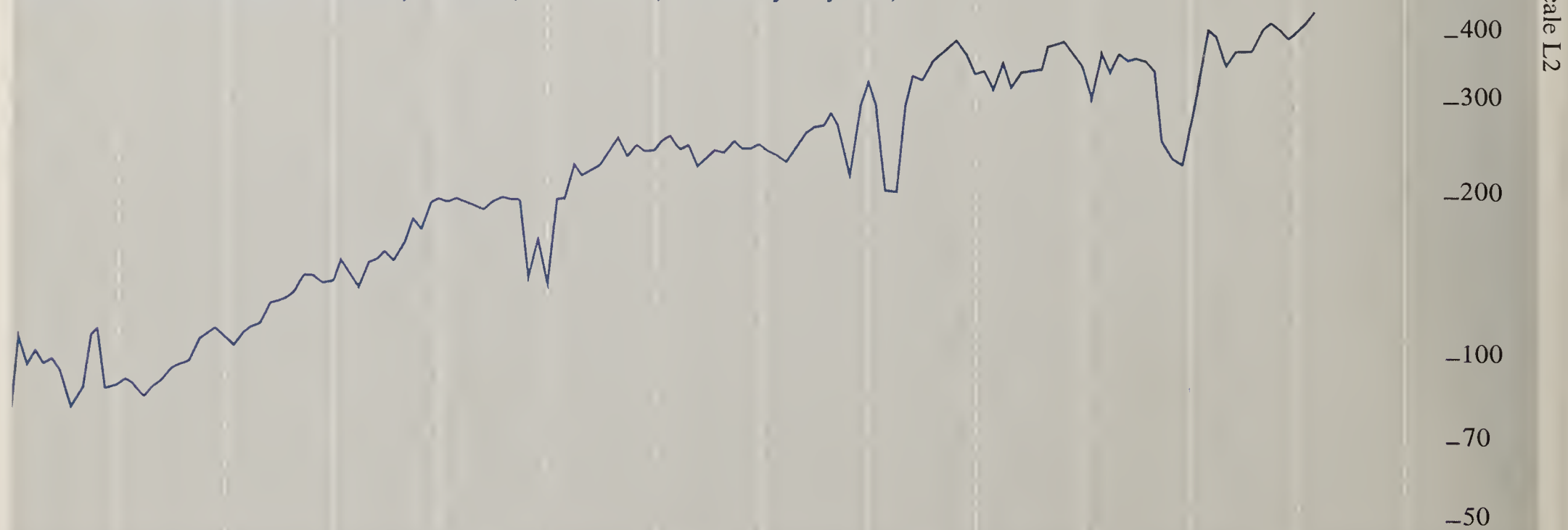
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)



1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

Economic Indicators

Seasonally Adjusted

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^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.

1964		1965 (continued)			
Jan.	(Annual Review)	Dec.	(Annual Review)	May-June	The Reform of Taxation and Government Structure in Ontario
Feb.	Tobacco — Ontario's Major Cash Crop	1966		July-Aug.	St. Lawrence Seaway — Impact on Ontario
March	Canada's Requirements for New Business Machinery and Equipment from 1965 to 1975	Jan.-Feb.	Opportunity through On-the-Job Training	Sept.-Oct.	Air Pollution and the Utilization of Natural Gas in Automobile Vehicles
April	Some Impressions Arising from the First Year of Operation of the Ontario Development Agency	March	The Development of Ontario's Textile Industry	Nov.-Dec.	An Analysis of Population Growth Trends in Ontario
May	Ontario Labour Markets, 1953-1963	April	"The New Economics" and the Province of Ontario	1970	
June	The Approach of Regional Analysis	May-June	Progress Under the Automotive Free Trade Agreement: Some Comments	Jan.-Feb.	The Input/Output Structure of the Ontario Economy
July	The Niagara Economic Region: Present Characteristics and Prospects of the Future	July	Ontario's New Housing Program	Mar.-Apr.	Economic Aspects of Environmental Quality for Ontario
Aug.	The Development of Forestry Policy	Aug.-Sept.	Economic Education	May-June	The Public Sector and Economic Policy
Sept.	An Index of Economic Health for Ontario Counties and Districts	Oct.-Nov.	The Distribution of Personal Income in Ontario and the Ten Economic Regions	July-Aug.	Design for Development: The Toronto-Centred Region
Oct.	Preliminary Indexes of Production in Ontario	Dec.	Canada and the U.S. Guidelines	Sept.-Oct.	Geocoding — A Technique in the Development of Urban Information Systems
Nov.	A Pilot Study on Regional Labour Income in Ontario	1967		Nov.-Dec.	The Development of Ontario Economic Accounts
Dec.	The Growth and Development of Primary Iron and Steel in Ontario	Jan.-Feb.	(Annual Review)	1971	
1965		Mar.-Apr.	Fertility and Population Growth in Ontario	Jan.-Feb.	Tax Reform and Small Business
Jan.	Oil and Natural Gas in Ontario	May-June	Soybeans in Ontario: Production, Utilization and Prospects	March	Special Supplement — An Econometric Model for the Ontario Economy
Feb.	Ontario Regional Population Projections 1961-1986	July-Aug.	Population Migration to and from Ontario	Mar.-Apr.	Price Changes 1961-1970: An Economic Analysis
March	Significant Economic Changes in Agriculture	Sept.-Oct.	Towards a Theory of Provincial-Municipal Grants	May-June	An Analysis of Fertility Trends in Ontario
April	The Growth and Development of the Furniture Industry in Ontario	Nov.-Dec.	Ontario's Demand for Industrial and Agricultural Machinery to 1976	July-Aug.	Provincial-Municipal Reform: A Progress Report
May	The Institutional Investor and the Securities Market	1968		Sept.-Oct.	Ontario Economic Accounts: A Dual Approach to the Measurement of Provincial Product
June	The Growth and Development of the Motor Vehicle Industry in Ontario	Jan.-Feb.	The Economy in 1967	Nov.-Dec.	Federal and Ontario Fiscal Policy in 1970 and 1971
July	Perspective on Recent Price Movements in Canada	Mar.-Apr.	Trade Liberalization and the Forest Industries	1972	
Aug.	The Background of Federal Unconditional Grants to the Provinces 1867-1887	May-June	Potato Marketing in Ontario	Jan.-Feb.	The Input-Output Structure of the Niagara Region
Sept.	A Progress Report on the Economic Atlas of Ontario	July-Aug.	Budgetary Constraints to Policy Development	March	Special Supplement — Sectoral Characteristics of the Ontario Structure of Production
Oct.	Educational Achievement Levels in Ontario	Sept.-Oct.	The Pattern of Consumer Expenditure at Provincial and Regional Level	Mar.-Apr.	Ontario's Property Tax Credit Plan
Nov.	Concentration and Competition in Ontario's Fluid Milk Industry	Nov.-Dec.	Development of Information Flows for Economic and Financial Policy Formulation	May-June	The Ontario Government and the Pickering Airport Site
		1969			
		Jan.-Feb.	Preliminary Population Projections for Ontario 1971-1991		
		Mar.-Apr.	The Solemnization of an Institutional Marriage (or the joining of the 'Treasury' with 'Economics')		

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May/Jun		1972
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September/October 1972
Volume 10, Number 4

Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics and Intergovernmental Affairs
H. Ian Macdonald, Deputy Minister

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Ontario Economic Review

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Volume 10, Number 4

The Ontario Economy

1

An Analysis of Mortality Patterns in Ontario

2

T. R. Barratt, *Demographer*

Ministry of Treasury, Economics and Intergovernmental Affairs

Selected Economic Indicators

22

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Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics and
Intergovernmental Affairs*

H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Office for Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Ministry.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Ministry of Treasury, Economics and Intergovernmental Affairs, Frost Building, Queen's Park, Toronto 182, Ontario.

About the Review

The feature article of the September/October edition examines some of the more significant aspects of mortality in Ontario. Mortality rates for different age and sex groups are established and are compared on a province-wide basis, and in some instances, on an international basis.

Over the last decade, Ontario and Canada have experienced steadily declining death rates, while some industrial nations have witnessed little improvement in mortality levels. In Ontario, declines in the rate of infant and maternal mortality, in particular, have been dramatic.

In the last fifty years, improvement in female mortality far outstripped that for males. For both males and females, however, heart disease remains the number one cause of death, and continues to claim an ever increasing proportion of lives.

This article was prepared by T. R. Barratt in the Economic Analysis Branch of the Office for Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs.

Indicator Charts, Pages 22-24

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 22-24 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

The Growth of the Canadian Economy in the Second Quarter of 1972

Preliminary estimates of the National Income and Expenditure Accounts for the second quarter of 1972, recently published by Statistics Canada, indicate an increase in the production of goods and services, characterized by strengthened domestic and foreign demand and by a moderation in the overall rate of price increase.

Canada's gross national product, seasonally adjusted at annual rates, rose by \$2.9 billion in the second quarter to reach a level of \$102 billion, an increase of 3.0 per cent over the first quarter. The rise in the implicit price index of GNP, slowed to 0.8 per cent, compared with the 1.4 per cent increase witnessed in the previous quarter. After discounting that part of the increase in the value of goods and services due to higher prices, GNP rose by 2.1 per cent in the second quarter. The gain in real output in the first quarter was 1.2 per cent.

The stimulus to production in the second quarter was largely provided by personal expenditure on consumer goods and services and by foreign trade, as the rate of growth in exports outpaced imports, thus reversing the trend shown in the first quarter. Large gains in business spending on machinery and equipment and in government capital expenditure, contributed to a lesser degree, but more than offset the dull performance in construction.

Since the last quarter of 1971, real GNP has been rising at a quarterly rate of 1.6 per cent, about the same rate as during 1971. A continuing strong gain in consumer expenditure, which rose at a quarterly rate of 2.7 per cent in the six-month period, was a major force behind the expansion. The second quarter increase of \$1.9 billion was one of the largest in recent years and brought consumer expenditure to a level of \$59.3 billion.

Personal income in the second quarter rose by 4.3 per cent, seasonally adjusted — the largest percentage gain in many years — while personal disposable income grew even faster, by 5.5 per cent.

Consumer demand was buoyed by a billion dollar increase in transfer payments, mostly in the form of old age pensions and unemployment insurance benefits. The acceleration in the rate of consumer spending was entirely due to an upsurge of 4.2 per

cent in expenditure on goods, twice the first quarter rate of increase. Spending on new automobiles was particularly strong, up by almost 18 per cent after an 8.6 per cent decline in the first quarter. Business investment, with expenditure on machinery and equipment rising by 5.7 per cent in the second quarter, contributed appreciably to the economic growth achieved during the quarter.

The substantial improvement in Canada's current account balance contributed significantly to the strength of the economy as measured by GNP. Quarterly Estimates of the Canadian Balance of International Payments for the second quarter of 1972, recently released by Statistics Canada, indicate that the seasonally adjusted current account deficit fell to \$17 million from \$325 million in the first quarter. This improvement in the current account balance was largely due to the increase in the merchandise trade surplus, which at \$429 million, amounted to some 2.5 times that in the first quarter.

Exports, seasonally adjusted, rose by over 8 per cent to \$4,982 million, while imports went up by 3 per cent to \$4,553 million. The strike at St. Lawrence ports in May and June does not appear to have affected significantly the overall level of exports and imports in the quarter. The rate of growth of imports in the second quarter was the lowest since the decline recorded in the fourth quarter of 1970 when trade in automotive products was substantially affected by strikes.

Capital movements between Canada and other countries in the second quarter of 1972, resulted in a net capital inflow of \$395 million, down \$135 million from the first quarter capital inflow of \$530 million. Canada's net official monetary assets totalled U.S. \$6,218 million at June 30, 1972, an increase of U.S. \$470 million over the quarter. Of this change, U.S. \$134 million occurred as a result of the revaluation of the stock of Canada's gold-based assets in May. These assets include gold, special drawing rights and Canada's reserve position in the International Monetary Fund. Reserves, therefore, rose by U.S. \$336 million apart from the revaluation of existing holdings.

The spot value of the Canadian dollar on foreign exchange markets rose markedly in the quarter, reaching a new 10-year peak in

late June as the United States dollar dipped to 97.41 Canadian cents from a mid-April value of 99.81 Canadian cents. The spot value of the United States dollar closed the quarter at 98.47 Canadian cents. The pound sterling dropped sharply in relation to the Canadian dollar following the British government's decision to allow the pound to float.

Sales of new motor vehicles in August, up almost 20 per cent compared with the same month a year ago, reached a level of 72,800 units. Recent statistics released by Statistics Canada, show that the value of sales amounted to \$291.9 million, 33.1 per cent higher than in August 1971 when 60,841 vehicles were sold.

The number of passenger cars sold increased by 14 per cent, with commercial vehicles increasing 47.1 per cent, while the dollar value of sales increased by 23 per cent and 65.2 per cent respectively. A notable feature of the August performance was that it was the first time in several years that sales of imported passenger cars had declined, when compared with the same month in the previous year. Although the sales value of foreign cars increased by 6.4 per cent, the number of vehicles sold fell by 4.2 per cent from 18,704 to 17,911. The number of Canadian and U.S. passenger cars sold rose by 24.8 per cent, from 31,800 to 39,682, representing a 30.2 per cent increase in the value of sales.

Figures for the first eight months of this year show new vehicle sales to have risen by 16 per cent over the corresponding period last year; passenger car sales recorded a 12.3 per cent increase and commercial vehicles a 34.2 per cent increase.

Neither North American manufacturers nor their foreign competitors were able to increase their share of the passenger car market. North American cars accounted for 75.2 per cent of the domestic market with the remaining 24.8 per cent taken up by cars manufactured abroad.

The average price paid for the North American car rose by 3.7 per cent, from \$3,732 to \$3,869. Foreign cars also cost more to buy, the average price rising from \$2,671 to \$2,977 — a rise of 11.5 per cent — thereby increasing their share of the market, in terms of dollars, from 19.1 per cent to 20.2 per cent.

T. R. Barratt, *Demographer*
Ministry of Treasury, Economics and Intergovernmental Affairs

This study presents a review of the more significant aspects of mortality in Ontario. Its purpose is to place provincial mortality patterns within an international framework and to provide an historical perspective for a variety of mortality data. The data cover primarily the last decade, however in some instances, mortality trends have been traced back to 1921.

Statistics shown were, in the main, calculated by the Economic Analysis Branch, Ministry of Treasury, Economics and Intergovernmental Affairs, and are based on Census of Canada and Ontario Vital Statistics reports. Some material was taken directly from these sources as well as from Statistics Canada Vital Statistics publications. Data sources other than these are identified in the body of the report.

It should be pointed out that statistics shown for other than census years are based on population estimates and not on actual counts.

I – MORTALITY LEVELS

International Crude Death Rates

Crude death rates (deaths per 1,000 population) have shown varying patterns over the last decade. It can be seen from Table I that in industrialized countries, death rates have declined in about half the cases and increased in the other.

Israel, which had the lowest rate in 1961 (5.8 per 1,000 population) showed the greatest percentage increase (20.7) but still had the second lowest death rate in 1969. Canada ranked third in 1969 with Ontario experiencing a rate slightly higher than the national average. The rates for both Canada and Ontario have declined steadily over the period, whereas the United Kingdom, Germany and France which had the highest rates in 1969, have shown no significant improvement since 1961.

It is difficult to estimate the effects of changing age distributions on crude rates. It appears that many of the increasing rates, especially in Israel, could be attributed to an aging population. Without age specific data, however, concrete conclusions cannot be drawn.

The Ontario Crude Death Rate

The pattern of crude death rates for Ontario from 1921 to 1970 is outlined in Table A¹ Rates declined from 11.8 deaths per 1,000 population in 1921 to a level of 7.4 in 1970 – a decline of 37 per cent. Female rates showed a decrease of 45 per cent (11.4 to 6.3), and for males a decrease of 30 per cent (12.2 to 8.5). Death rates for the total population declined steadily from 11.8 in 1921 to 9.9 in 1934, increased during the period 1935 to 1947, whereupon they have steadily fallen to their present level.

Between 1921 and 1933 the male death rate varied from a high of 12.2 to a low of 10.3. It continued to fluctuate up to 1950, thereafter it steadily declined. The female rate reached a high of 11.5 in 1923, dropped from 10.5 in 1930 to 9.8 in 1931, and rose the following year to 10.1. From 1936 to the present, rates have continued to decrease.

Age Specific Rates

Although crude rates give a general picture of mortality trends, they are affected not only by changing mortality patterns, but also by shifts in the age distribution of the population. It is advantageous, therefore, to examine age specific data in order to eliminate the effect of age distribution. Table B¹ traces age and sex-specific patterns of mortality from 1921 to 1970 by five-year age groups.

This table clearly shows that the greatest decline in mortality occurred in age group 0 - 4. In the case of males, the rate dropped from 31.8 deaths per 1,000 population in 1921 to 4.5 in 1970 – a drop of almost 90 per cent. Similarly, the female rate plunged from 24.7 to 3.4 per 1,000 population during the same period – a drop of 86 per cent.

For male rates, improvements of 45 per cent or more occurred in all age groups up to age 44. Thereafter, declines were far less dramatic. Age group 65 - 69 actually showed an increase in mortality from 34.4 deaths per 1,000 in 1921 to 38.8 in 1970. Females, on the other hand, showed a significant decline in mortality in all age groups over the same period. For age group 65 - 69, for example, the female rate declined by 47 per cent, while the male rate increased.

The same table also provides the geometric mean of the age specific rates, the best single numeric indicator of mortality. The male geometric mean fell from 13.5 in 1921 to 7.0 in 1970 – a drop of 48 per cent. The female mean declined even more rapidly, from 12.9 in 1921 to 3.9 in 1970 – a decrease of almost 70 per cent.

Thus, over the period, improvement in female mortality patterns far outstripped that for males. While male mortality was only 5 per cent greater than female in 1921 (13.5 vs 12.9), it is now almost 80 per cent greater. In particular, males over the age of 44 have shown very little improvement in mortality during the last 40 years. It is to this segment of the population that efforts must be directed if male mortality is to be reduced.

Table I—Crude Death Rates, Selected Countries, 1961-1970

Country	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Percent Change 1961-1970
Canada	7.7	7.7	7.8	7.6	7.6	7.5	7.4	7.4	7.3	7.3	— 5.2
Ontario	8.2	8.2	8.3	7.9	8.0	7.8	7.7	7.6	7.5	7.4	— 9.8
U.S.A.	9.3	9.5	9.6	9.4	9.4	9.5	9.4	9.7	9.5*	9.4*	+ 1.1
U.S.S.R.	7.2	7.5	7.2	6.9	7.3	7.3	7.6	7.7	8.1	8.2*	+13.9
Australia	8.5	8.7	8.7	9.0	8.8	9.0	8.7	9.1	8.7	9.0	+ 5.9
New Zealand	9.0	8.9	8.8	8.8	8.7	8.9	8.4	8.9	8.7	8.8*	— 2.2
Israel	5.8	6.0	6.1	6.3	6.3	6.3	6.6	6.8	7.0	7.0	+20.7
Japan	7.4	7.5	7.0	6.9	7.1	6.8	6.8	6.8	6.7*	6.9*	— 6.8
France	10.8	11.5	11.7	10.7	11.2	10.8	11.0	11.1	11.3*	10.6*	— 1.9
Germany (West)	11.0	11.1	11.4	10.8	11.2	11.3	11.2	11.9	12.0*	11.6*	+ 5.5
Italy	9.4	10.1	10.2	9.6	10.0	9.6	9.7	10.1	10.1	9.7*	+ 3.2
Poland	7.6	7.9	7.5	7.6	7.4	7.3	7.8	7.6	8.1	8.1*	+ 6.6
Spain	8.6	9.0	9.1	8.7	8.7	8.6	8.7	8.7	9.2*	8.6*	0.0
Sweden	9.8	10.2	10.1	10.0	10.1	10.0	10.1	10.4	10.5*	9.9*	+ 1.0
United Kingdom	12.0	11.9	12.2	11.3	11.5	11.8	11.3	11.8	11.9*	11.8*	— 1.7

*Provisional

Source: United Nations Demographic Yearbook, 1970

¹See Appendix

Life Expectancy

Mortality patterns become more visible when life expectancy is considered. Table C¹ depicts life expectancy at each age for males and females during the period 1931 to 1966. In 1931, for example, a newborn male could expect to live 61.3 years. If born in 1966 however, the same male could expect to live 68.7 years — about 7 years longer. A man entering the labour force at age 18 could, in 1931, expect to live another 48.8 years. By 1966 his life expectancy at that age would be 51.1 years, or about 2 years longer. Upon retiring at age 65, a man in 1931 could expect to live another 12.7 years, or until about age 78. In 1966, at retirement, the same man could expect to live 13.1 more years, or also to the approximate age of 78. In fact, in the 35 years between 1931 and 1966, life expectancy at age 65 had increased by only 4 months.

A female born in 1931 could expect to live 63.9 years (compared with 61.3 for males). A newborn in 1966 however, could expect to live to 75.5 (opposed to 68.7 for males). In 1931 life expectancy for females at age 18 was 51.9 years (50.5 for males), whereas by 1966 this had increased to 59.4 (53 for males). At age 65 a female could expect to live another 13.5 years (12.8 for males). By 1966 however, she could expect to live another 16.7 years (opposed to 13.1 for males). At retirement, therefore, a female can be expected to outlive a male by almost 4 years. In 1931, however, she could have expected to outlive him by about 10 months only.

Thus, not only do females tend to live longer than males but the gap is widening. Some sociologists believe that this discrepancy in life expectancy will eventually cause females to begin marrying younger men in order to decrease the prospect of being widowed.

Seasonality

An examination of monthly data indicates that mortality seems to follow a seasonal pattern within the year. Table II compares the actual number of deaths recorded, by month, in 1965, with the number of deaths expected, should no seasonality exist.

It can be seen from the table that deaths tended to be higher than expected during the winter months and lower than expected during the summer months. October, November, December, January, February, March

and April averaged almost 4 per cent more deaths than would normally have been expected, while May, June, July, August and September averaged over 5 per cent fewer than expected. This pattern is repeated from year to year with only minor variations. The exact causes of these fluctuations have been a puzzle to demographers for many years.

County Mortality

Mortality patterns for most countries, districts and regions of Ontario, follow very closely the provincial trend. Over the last two decades, all but 7 counties experienced declines in crude death rates. Generally, rates were higher than average in the northern areas, while southern and central areas experienced lower rates. The largest decline occurred in Peel County where the crude rate dropped from 8.0 per 1,000 in 1951 to 4.2 in 1970. The male rate declined from 8.7 to 4.7 per 1,000, while the female rate fell to 3.7 from 7.4 during the same period.

County Geometric Means

A more precise indication of county mortality trends can be found by examining the geometric means of the age specific rates. Kenora had the highest levels of mortality during this period with the geometric mean averaging 6.82. Sex specifically, Kenora ranked highest in female mortality (5.24) and second highest in male mortality (8.79). Cochrane had the highest male mortality level (8.86), while ranking second in female (4.96) and second overall (6.74).

Haliburton had the lowest overall rates, averaging a geometric mean of 4.76, and ranked second lowest for females with 3.59, while males finished in the lower half of the table with an average of 7.17. Peel County had the lowest male rates with the means averaging a surprising 3.54 over the nine-year period. Of the 53 counties and districts studied, 23 had levels above the provincial average and 30 were below.

II — INFANT MORTALITY

International Scene

An infant death is one that occurs before the child reaches one year of age. Infant mortality rates for selected countries are shown in Table III. During the period 1961 to 1969, all countries experienced decreasing rates. Poland had the highest rates, while Sweden enjoyed the lowest. The greatest change in rates was Japan where a level of 28.6 deaths per 1,000 live births in 1961 fell to a level of 15.3 in 1968 — a drop of 46.5 per cent in 8 years.

Rates in Australia do not seem to have undergone the dramatic changes evident in most other countries. Provisional data shows a decline of only 5.2 per cent during a 9 year period. Ontario rates are consistently lower than those for Canada and occupy sixth place in the international table. If the infant mortality rate in Sweden is to be taken as a standard, it is evident that the other countries have considerable room for improvement.

Table II—Deaths by Month, Ontario, 1965

	Number of Actual Deaths	Expected Deaths	Difference	%
January	4,880	4,615.69	264.31	5.73
February	4,347	4,169.01	177.99	4.27
March	4,917	4,615.69	301.31	6.53
April	4,480	4,466.79	13.21	0.30
May	4,466	4,615.69	—149.69	—3.24
June	4,384	4,466.79	— 82.79	—1.85
July	4,287	4,615.69	—328.69	—7.12
August	4,228	4,615.69	—387.69	—8.40
September	4,227	4,466.79	—239.79	—5.37
October	4,625	4,615.69	9.31	0.20
November	4,615	4,466.79	148.21	3.32
December	4,890	4,615.69	274.31	5.94
Total	54,346	54,346.00	0.0	

¹See Appendix

Table III—Infant Mortality per 1,000 Live Births, Selected Countries, 1961-1970

Country	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Percent Change 1961-1970
Canada	27.2	27.6	26.3	24.7	23.6	23.1	22.0	20.8	19.3	18.8	—30.9
Ontario	23.0	23.2	22.8	21.3	20.5	20.2	19.7	19.0	17.6	16.8	—27.0
U.S.A.	25.3	25.3	25.2	24.8	24.7	23.7	22.4	21.8	20.7*	19.8*	—21.7
U.S.S.R.	32.0	32.0	30.9	29.0	27.0	26.1	26.3	26.4	25.8	24.4*	—23.8
Australia	19.5	20.4	19.5	19.1	18.5	18.2	18.3	17.8*	17.9*	17.9*	— 8.2
New Zealand	22.8	20.4	19.6	19.1	19.5	17.7	18.0	18.7	16.9	16.7	—26.8
Israel	29.1	32.3	27.5	28.2	27.4	25.3	25.9	24.8	23.5	23.6	—18.9
Japan	28.6	26.4	23.2	20.4	18.5	19.3	14.9	15.3	15.3*	n/a	—46.5
France	25.6	25.7	25.4	23.3	22.0	21.7	20.7	20.4	16.4*	15.1	—41.0
Germany (West)	31.7	29.2	26.9	25.2	23.8	23.5	22.8	22.8	23.3	23.5*	—25.9
Italy	40.7	41.8	40.1	36.1	35.6	34.7	33.2	32.7	30.3	29.2	—28.3
Poland	54.1	54.8	48.7	47.7	41.8	38.9	38.1	33.4	34.3	33.1*	—38.8
Spain	46.2	41.6	40.5	37.9	37.3	36.0	34.0	32.0*	29.8*	27.8*	—39.8
Sweden	15.8	15.4	15.4	14.2	13.3	12.6	12.9	13.1	n/a	n/a	—17.1
United Kingdom	22.1	22.4	21.8	20.6	19.6	19.6	18.9	18.6	18.6	n/a	—15.8

*Provisional

Source: United Nations Demographic Yearbook, 1970

Ontario

From Table IV it can be seen that infant mortality in Ontario has been steadily declining over the past 50 years. From a level of 91 infant deaths per 1,000 live births in 1921, the rate reached a low of 18 per 1,000 in 1969 — a drop of over 80 per cent. During the period 1960 - 1969, there was a decline of 25 per cent, as the rate fell from 24 deaths per 1,000 to 18.

More detailed data on infant mortality reveal that male rates fell from 25.87 in 1961 to 19.82 in 1969 — a decline of 23.4 per cent, while female infant mortality dropped 23.3 per cent from 19.98 to 15.33.

An examination of monthly data indicates that the vast majority of deaths occur during the first month. For both males and females, over 70 per cent of infant deaths occur within the first month of life. In addition, approximately 6 per cent of deaths occur during the second month and just over 5 per cent during the third. The percentage of deaths during the remaining 9 months gradually tapers off until only about one half of one per cent occur during the final month. There can be no question that the first month of life is by far the most critical in a child's existence. Furthermore, the female rate is about 23 per cent lower than that for males.

County Infant Mortality

Infant mortality patterns for the counties and districts of Ontario from 1921 to 1969 are presented in Table D¹. All areas showed a pattern of declining infant mortality during the period. In 1921 Haliburton showed the highest rate at 158.8 deaths per 1,000 live births. By 1969, however, Haliburton's rate had fallen into line with the other areas and was actually lower than the provincial average.

The lowest rate in 1921 was in Lennox and Addington (46.2). The relatively small population of this county, resulting in very few births and infant deaths, caused rates to fluctuate greatly. In 1926, for example, the rate was 92.5, almost double that in 1921. In 1969 Russell had the highest level of infant mortality (43.2 per 1,000 live births) with Lennox and Addington again having the lowest (6.4).

In York County, the rates underwent almost continuous decline, from a level of 89.5 in 1921 to 14.6 in 1969 — a decrease of 83.7 per cent. By 1969 the level for York had almost reached the latest recorded level for Sweden (13.1), long considered the standard for which to strive.

One of the most dramatic declines in infant mortality occurred in Thunder Bay.

From a level of 111.9 in 1921, the rate had fallen to 15.2 by 1969 — a drop of over 86 per cent. Similarly, in Carleton County the rate fell by 85.5 per cent from 125.5 in 1921 to 18.2 in 1969. Great improvements in infant mortality have occurred throughout the province, making it one of the leaders in the fight against infant death.

III — MATERNAL MORTALITY

The decline in maternal mortality has been as dramatic as that in infant mortality. Table V shows maternal mortality rates for Ontario for the period 1938 - 1969. Since 1938 when reliable data first became available, the number of maternal deaths in Ontario has

Table IV—Infant Mortality per 1,000 Live Births, Ontario, 1921-1969

Year	Infant Mortality	Year	Infant Mortality
1921	91	1946	37
1922	83	1947	36
1923	85	1948	35
1924	76	1949	37
1925	79		
1926	78	1950	35
1927	71	1951	31
1928	71	1952	31
1929	76	1953	28
		1954	26
1930	74	1955	26
1931	70	1956	25
1932	62	1957	25
1933	60	1958	25
1934	57	1959	24
1935	56		
1936	55	1960	24
1937	55	1961	23
1938	49	1962	23
1939	46	1963	23
		1964	21
1940	43	1965	21
1941	46	1966	20
1942	40	1967	20
1943	42	1968	19
1944	43	1969	18
1945	41		

Figures rounded to nearest whole number to be consistent with earlier data.

¹See Appendix

declined from 251 to 20 in 1969 — a drop of 92 per cent.

Maternal mortality per 10,000 live births has fallen dramatically from 38.28 in 1938 to 1.53 in 1969 — a decline of 96 per cent. The *general maternal mortality rate* (deaths per 10,000 females aged 15 - 44) fell from 2.96 to .13 during this period — a drop of 95.6 per cent.

Table VI illustrates age specific maternal mortality rates for Ontario from 1961 to 1969. It demonstrates that the older the mother, the more likely she is to die during childbirth. Women aged 15 to 19, for example, averaged only 1.92 deaths for every 10,000 live births. For age group 40 - 44, however, the rate was more than five times as high. While maternal mortality for women aged 15 - 34 decreased between 1961 and 1969, there was no significant decline for women of age 34 and over. Thus the difference in the maternal mortality rate between younger and older women continues to increase.

IV — CAUSES OF DEATH

Six major causes account for about 85 per cent of all deaths in Ontario. Table E¹ outlines these causes, and presents rates specific to six selected age groups for the years 1961 - 1969. It is important to note that age group 0 is not considered in this table, and is dealt with separately.

Male Deaths

As can be seen in the table, male rates for accidental and violent deaths have remained relatively steady throughout the period. Age group 1 - 4 ranged from a high of .47 deaths per 1,000 population in 1962 to a low of .29 in 1969. For age group 5 - 14, 1963 and 1964 showed the highest rates at .34 deaths per 1,000. Age group 65+ had the highest rates of any remaining group, at about 2 deaths per 1,000 over the period.

The proportion of deaths from congenital malformations is relatively small for all age groups as this usually affects the newborn. Rates are highest for age group 1 - 4 and have tended to decline over the period. Rates for other age groups have remained at constantly low levels.

Death rates for neoplasms (cancer) remained at low levels for ages 1 - 34 throughout 1961 - 1969. For age group 35 - 64, rates increased slightly from 1.71 per 1,000 in 1961 to 1.85 in 1969. For males over 65,

Table V—Maternal Mortality Rates per 10,000 Live Births, General Maternal Mortality Rates (per 10,000 females aged 15-44), Ontario, 1938-1969

Year	Number of Maternal Deaths	Deaths per 10,000 live births	Deaths per 10,000 females aged 15-44
1938	251	38.28	2.96
1939	276	43.04	3.22
1940	254	37.21	2.94
1941	219	30.31	2.50
1942	206	26.35	2.28
1943	189	23.28	2.09
1944	198	25.36	2.17
1945	171	21.65	1.85
% change 1938-1945		—31.9%	—43.4%
1946	160	16.42	1.70
1947	129	11.85	1.35
1948	125	12.00	1.30
1949	134	12.57	1.37
1950	97	8.92	.97
% change 1946-1950		—39.4%	—45.7%
1951	97	8.45	.95
1952	100	8.07	.95
1953	69	5.32	.64
1954	69	5.06	.62
1955	81	5.80	.63
% change 1951-1955		—16.5%	—31.4%
1956	70	4.88	.61
1957	55	3.64	.46
1958	70	4.59	.57
1959	73	4.65	.59
1960	55	3.45	.44
% change 1956-1960		—21.4%	—29.3%
1961	67	4.25	.52
1962	54	3.46	.42
1963	46	2.97	.35
1964	43	2.82	.32
1965	44	3.11	.32
% change 1961-1965		—34.3%	—26.8%
1966	36	2.73	.25
1967	29	2.27	.23
1968	22	1.74	.17
1969	20	1.53	.13
% change 1966-1969		—44.4%	—44.0%
Total % change 1938-1969		—92.0%	—96.0%
			—95.6%

¹See Appendix

Table VI—Age Specific Maternal Mortality Rates per 10,000 Live Births, Ontario, 1961-1969

Years	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1961	4.06	1.91	3.16	6.92	6.67	11.59	38.02
1962	2.73	1.46	3.46	3.36	4.49	17.97	124.48
1963	.67	1.66	3.05	2.40	8.33	8.94	—*
1964	.65	1.69	2.15	5.34	4.63	6.65	—
1965	4.29	.91	1.58	4.39	7.97	9.74	36.50
1966	1.19	.48	2.29	4.13	8.13	13.07	—
1967	2.45	.70	1.16	6.04	4.67	3.10	—
1968	1.26	.69	1.70	2.12	4.17	10.73	—
1969	—*	.44	.53	2.63	7.84	15.49	—
Avg.	1.92	1.10	2.12	4.15	6.32	10.83	22.11

*No deaths reported.

the rates were fairly high and tended to increase over the period, rising from 11.68 in 1961 to 13.35 in 1969.

Deaths resulting from nervous system disease tended to be high only in the 65+ age group. The rate declined from 10.28 in 1961 to 8.89 in 1968. This category was redefined in 1969, thereby making rates for that year not directly comparable with earlier years.

Death rates due to circulatory disease (mainly heart disease) were highest of all for age groups 35 and over. In age group 35 - 39, rates remained constant at just over 4 deaths per 1,000 males. However, for males aged 65 and over, rates rose from a level of 36.45 deaths per 1,000 in 1961 to a level of 42.61 in 1969. Deaths arising from respiratory diseases tended to be low in comparison with those from circulatory diseases, although the rate did increase from 4.33 to 6.14 for persons over 65 years.

Data showing the percentage distribution for the cause of death for each age group, indicate that in 1961, 4.77 per cent of accidental and violent deaths occurred in age group 1 - 4, while 38.19 per cent occurred in age group 35 - 64. The distribution of accidental and violent deaths over the different age groups tended to remain relatively stable over the period 1961 - 1969, except for age groups 1 - 4 and 15 - 24. Age group 1 - 4 accounted for 4.77 per cent of those deaths in 1961 but only 2.54 per cent in 1969. For ages 15 - 24, however, their percentage of accidental and violent deaths increased from 14.45 to 20.92.

Deaths due to neoplasms tended to concentrate in the middle- and old-age groups,

with about 37 per cent of deaths occurring in the 35 - 64 age bracket and 58 per cent in the 65+ group.

Similarly, deaths due to nervous system, circulatory and respiratory diseases, tended to affect only older males. Almost 80 per cent of deaths due to nervous system disease occurred in the 65+ age group with the remainder occurring in age group 35 - 64. In the case of circulatory disease, the 65+ group accounted for almost 70 per cent of deaths and the 35 - 64 group nearly 30 per cent, while for respiratory disease, it was 70 and 20 per cent respectively, with the other age groups accounting for the rest.

Data illustrating the percentage of deaths in each age group attributable to a particular cause, show that in 1961, 40.43 per cent of male deaths in age group 1 - 4 resulted from accidental or violent causes, 15.74 per cent from congenital malformations and 10.8 per cent from neoplasms. Similarly, in 1962, 43.81 per cent of male deaths in age group 1 - 4 were accidental or violent and in 1969 the percentage was 38.39.

During 1961 - 1969, the percentage of male deaths due to accidental and violent causes remained consistently high for males aged 34 and under. For the 15 - 24 age group, accidental and violent means accounted for 73 per cent of deaths in 1961 and over 89 per cent in 1968 and 1969.

For males aged 1 - 4, there was a decline in deaths due to congenital malformations, but the percentage of deaths due to neoplasms in 1969 was nearly double the 1961 figure. In addition, there was a slight decrease in the percentage of deaths due to both nervous and respiratory system diseases

in this age group. For males aged 35 and over, the number one cause of death is circulatory system disease and this continues to claim an ever increasing number of lives.

Deaths due to neoplasms are highest in the 34 - 64 male age group and lowest in the 15 - 24 group. During 1961 - 1969, the percentage of deaths due to neoplasms tended to increase. Deaths caused by nervous system disease are highest in the 65+ age group, but the percentage is gradually falling. Respiratory diseases cause more male deaths in the 1 - 4 age group than in other age groups.

Female Deaths

Female rates, as can be observed in Table E¹, follow male patterns fairly closely, except that rates tend to be 25 to 50 per cent lower. The exception, however, is deaths due to nervous system disease, where female rates are about equal to, if not greater than, male rates. It seems that while female resistance to disease is greater for most illnesses, the female experiences patterns of nervous system disease similar to males. The reasons for this are difficult to trace, since the data available (Ontario Vital Statistics), although divided into eight categories, list two-thirds of deaths as 'other'.

The percentage distribution of female deaths basically follows the same pattern as the male distribution although deaths appear to concentrate even more in the 65+ age group. The only exception to this is the case of neoplasms where the proportion of deaths in the 34 - 65 age group is higher for females than for males. Thus, while neoplasms tend to strike females at an earlier age than males, most other diseases seem to strike them later in life.

Data showing the percentage of deaths in each age group attributable to a particular cause indicate that, for females as well as males, accidental and violent causes result in a high percentage of deaths for age group 1 - 34. In age group 15 - 24, 45 per cent of female deaths resulted from these causes in 1961, but by 1969 this figure had significantly increased to 64 per cent. For females aged 1 - 4, the percentage of deaths attributed to accidental and violent causes varied from 31 per cent to 52 per cent of all female deaths between 1961 and 1969.

Deaths due to congenital malformations varied from a low of 11 per cent in 1966 to

¹See Appendix

a high of 23 per cent in 1969. The percentage of female deaths as a result of neoplasms increased during the period, while nervous system disorders decreased and respiratory disease remained about the same.

For females aged 35 - 64, the number one cause of death was neoplasms, closely followed by heart disease. For the age group 65+ heart disease was the biggest killer with 49 per cent in 1961 and 60 per cent in 1969. Deaths resulting from neoplasms were highest for the 35-64 age group and seem to be increasing throughout each group. Nervous system disease, which affects the 65+ age group the most, declined over the period. Respiratory system disease is most common in the 1 - 4 group, causing between 15 and 20 per cent of female deaths in this group.

Summary

The percentage of deaths for both males and females, due to accidental and violent causes, is increasing for persons aged 1 - 34, but the most dramatic increase has been in the 15 - 24 age group. In 1969, neoplasms and heart disease accounted for almost 72 per cent of total deaths in the 35 - 64 age group, while accounting for about 80 per cent in the 65+ age group. Improvement in the treatment of neoplasms and heart disease thus offers the best approach to reducing death rates for the middle-aged and elderly.

Regional Deaths

Table F¹ outlines 24 causes of death for the ten economic regions of Ontario in 1966. Tuberculosis comes to the fore as one of the more preventable diseases. Ontario Vital Statistics reveal that in 1928 it caused 1,832 deaths, producing a death rate of 55.9 per 100,000 population. By 1966, however, the number of deaths had fallen to 132 — a rate of 1.9 per 100,000 population. This represents a remarkable decrease of almost 97 per cent in the death rate for tuberculosis. In 1966, Midwestern Ontario had the lowest rate (1.17) with the Northeastern region measuring 3.68 and the Northwestern region showing 3.58 — more than triple the Midwestern region rate.

A surprising statistic shown in the table is the rate of death from circulatory disorders in the Georgian Bay region. This region witnessed a rate of 466 deaths per 100,000 persons from heart disease² in 1966. This was almost 41 per cent higher than the pro-

vincial figure. It is significant that the death rate for all causes for the Georgian Bay region was 29 per cent higher than the provincial figure in 1966.

The lowest level of heart disease was found in the Northeastern region, and was almost 19 per cent below the provincial average. This region also had the lowest overall death rate, averaging about 14 per cent below the provincial average.

The Central region, comprising Halton, Peel, York and Ontario counties and including the highly industrialized cities of Oshawa and Toronto had the second lowest mortality level. Furthermore, this region also ranked second lowest in the death rate from heart disease — almost 10 per cent below the provincial figure. It appears, at least for the year 1966, that theories stating that an urban-industrial environment is a cause of heart disease may be incorrect.

Motor vehicle accidents killed 1,636 persons in 1966 and were responsible for about 3 per cent of deaths. The highest rate of motor vehicle deaths was in the Northwestern region, while Central Ontario experienced the lowest rate — 33 per cent below the provincial average.

In 1966 there were 661 suicides in Ontario, accounting for about 1 per cent of all deaths. Although this is a substantial number, it is felt by many demographers that deaths by suicide are greatly under-reported, either consciously by physicians saving the surviving family the stigma of a suicidal death, or unconsciously because there is insufficient evidence to justify classifying the death as suicide. In countries where strict enforcement of suicide reporting is mandatory, rates tend to be much higher than in countries where reporting is usually left to doctors.

There were 66 homicides in the province in 1966, spread fairly evenly across the regions, with one significant exception. The lowest homicide rate was in the Midwestern region. However, the rate in Northwestern Ontario was twice as high as any other region and more than three times as high as the provincial average.

The Central region fared much better in terms of mortality than was generally thought, being lower than the provincial average in almost all categories. The Georgian Bay region was higher than average in many instances. Similarly, the Northwestern region

was considerably higher than the provincial figure for most causes of death.

V — CAUSES OF INFANT MORTALITY

Total male infant deaths (per 1,000 live births) declined from 25.87 in 1961 to 19.82 in 1969, while female rates dropped from 19.98 to 15.33 during the same period and were consistently lower than males.

Congenital malformations and immaturity are the main causes of death for both male and female infants. Together they accounted for 37 per cent of male deaths in 1961 and 36 per cent in 1969, corresponding figures for female deaths being 44 per cent in 1961 and 39 per cent in 1969. Infant deaths due to birth injuries and accidents remained relatively constant over the period and did not decrease in their proportion to the total number of infant deaths. In general, rates for both sexes are on the decline and improvement has been seen for most causes of infant mortality.

VI — CONCLUSION

Mortality rates have continued to decline over the last fifty years with the exception of the depression years and early war years. During the depression, low income levels caused people to defer hospital and doctor care much longer than usual. In addition, money was often not available to sustain the balanced diet necessary for good health. Since then, however, economic prosperity coupled with improved health care as well as significant advances in medical treatment have combined to lower provincial mortality levels.

Heart disease remains the biggest killer and, as yet, very little improvement has been made in the prevention and cure of this disease. Death rates from heart disease for both males and females have, in fact, increased over the last 10 years. Similarly, neoplasms have remained significantly high with rates failing to improve over the decade. These two areas remain of critical concern in the struggle against disease. Another area that could be improved is infant mortality. It is hoped that the present rate of 18 deaths per 1,000 live births will be reduced. In general, however, mortality has been steadily declining and will, in all probability continue to do so for some time to come.

¹See Appendix

²Heart disease makes up almost all of the circulatory disease category.

Table A—Crude Death Rates, by Sex, Ontario, 1921-1970

	Male			Female			Total		
	Population	Deaths	Rate	Population	Deaths	Rate	Population	Deaths	Rate
1921	1,481.9	18,062	12.2	1,451.8	16,489	11.4	2,933.7	34,551	11.8
1922	1,501.3	17,726	11.8	1,478.7	16,308	11.0	2,980.0	34,034	11.4
1923	1,512.6	18,452	12.2	1,500.4	17,184	11.5	3,013.0	35,636	11.8
1924	1,531.9	17,153	11.2	1,527.1	15,925	10.4	3,059.0	33,078	10.8
1925	1,553.0	17,583	11.3	1,558.0	16,377	10.5	3,111.0	33,960	10.9
1926	1,576.1	18,721	11.9	1,588.2	17,188	10.8	3,164.3	35,909	11.3
1927	1,611.9	18,305	11.4	1,607.1	16,470	10.2	3,219.0	34,775	10.8
1928	1,651.5	19,457	11.8	1,626.5	17,671	10.9	3,278.0	37,128	11.3
1929	1,685.5	20,281	12.0	1,648.5	17,842	10.8	3,334.0	38,123	11.4
1930	1,718.7	19,827	11.5	1,667.3	17,486	10.5	3,386.0	37,313	11.0
1931	1,748.9	19,137	10.9	1,682.8	16,568	9.8	3,431.7	35,705	10.4
1932	1,768.3	19,196	10.9	1,704.7	17,273	10.1	3,473.0	36,469	10.5
1933	1,788.3	18,489	10.3	1,723.7	16,812	9.8	3,512.0	35,301	10.1
1934	1,804.4	18,731	10.4	1,739.6	16,388	9.4	3,544.0	35,119	9.9
1935	1,820.5	19,281	10.6	1,754.5	17,036	9.7	3,575.0	36,317	10.2
1936	1,840.0	19,916	10.8	1,765.5	17,655	10.0	3,605.5	37,571	10.4
1937	1,851.2	20,690	11.2	1,785.8	17,785	10.0	3,637.0	38,475	10.6
1938	1,867.9	19,814	10.6	1,804.1	17,076	9.5	3,672.0	36,890	10.0
1939	1,884.5	20,310	10.8	1,823.5	17,220	9.4	3,708.0	37,530	10.1
1940	1,902.7	20,923	11.0	1,844.3	17,580	9.5	3,747.0	38,503	10.3
1941	1,921.2	21,549	11.2	1,866.5	17,677	9.5	3,787.7	39,226	10.4
1942	1,966.4	21,349	10.9	1,917.6	17,770	9.3	3,884.0	39,149	10.1
1943	1,981.6	22,159	11.2	1,933.4	18,904	9.8	3,915.0	41,063	10.5
1944	2,004.6	21,629	10.8	1,958.4	18,152	9.3	3,963.0	39,781	10.0
1945	2,014.6	21,563	10.7	1,985.4	17,936	9.0	4,000.0	39,499	9.9
1946	2,064.3	21,849	10.6	2,028.7	17,909	8.8	4,093.0	39,758	9.7
1947	2,106.4	22,891	10.9	2,069.6	18,728	9.0	4,176.0	41,619	10.0
1948	2,158.9	23,394	10.8	2,116.1	18,970	9.0	4,275.0	42,364	9.9
1949	2,210.5	24,123	10.9	2,167.5	19,256	8.9	4,378.0	43,379	9.9
1950	2,249.7	24,502	10.9	2,221.3	19,446	8.8	4,471.0	43,948	9.8
1951	2,314.2	24,483	10.6	2,283.4	19,498	8.5	4,597.6	43,981	9.6
1952	2,412.5	25,072	10.4	2,375.5	19,330	8.1	4,788.0	44,402	9.3
1953	2,491.9	25,347	10.2	2,449.1	19,895	8.1	4,941.0	45,242	9.2
1954	2,580.0	25,050	9.7	2,535.0	19,465	7.7	5,115.0	44,515	8.7
1955	2,653.8	25,890	9.8	2,612.2	19,544	7.5	5,266.0	45,434	8.6
1956	2,721.5	26,868	9.9	2,683.4	20,363	7.6	5,404.9	47,231	8.7
1957	2,840.0	28,059	9.9	2,796.0	21,105	7.5	5,636.0	49,164	8.7
1958	2,930.9	27,869	9.5	2,890.1	20,808	7.2	5,821.0	48,677	8.4
1959	3,005.8	28,695	9.5	2,963.2	21,905	7.4	5,969.0	50,600	8.5
1960	3,074.7	29,408	9.6	3,036.3	22,076	7.3	6,111.0	51,484	8.4
1961	3,134.5	29,248	9.3	3,101.6	21,749	7.0	6,236.1	50,997	8.2
1962	3,187.5	29,708	9.3	3,163.5	22,448	7.1	6,351.0	52,156	8.2
1963	3,247.8	30,762	9.5	3,233.2	22,855	7.1	6,481.0	53,617	8.3
1964	3,318.0	30,029	9.1	3,313.0	22,175	6.7	6,631.0	52,204	7.9
1965	3,394.8	31,275	9.2	3,393.2	23,071	6.8	6,788.0	54,346	8.0
1966	3,479.2	31,142	9.0	3,481.7	23,029	6.6	6,960.9	54,171	7.8
1967	3,573.2	31,694	8.9	3,575.8	23,184	6.5	7,149.0	54,878	7.7
1968	3,649.8	31,795	8.7	3,656.2	23,757	6.5	7,306.0	55,552	7.6
1969	3,721.8	31,799	8.5	3,730.2	23,922	6.4	7,452.0	55,721	7.5
1970	3,812.0	32,470	8.5	3,825.0	24,225	6.3	7,637.0	56,695	7.4

Table B—Death Rates, by Age and Sex, Ontario, 1921-1970

Male																		
Age Group	1921	1926	1931	1936	1941	1946	1951	1956	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
0-4	31.8	24.7	21.2	16.1	14.8	12.9	8.9	7.5	6.4	6.2	6.2	5.6	5.0	4.8	4.7	4.4	4.4	4.5
5-9	3.3	2.1	1.8	1.6	1.3	1.1	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
10-14	1.9	1.9	1.4	1.2	1.2	0.9	0.8	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4
15-19	3.1	2.6	2.2	1.6	1.7	1.2	1.3	1.4	1.1	1.0	1.1	1.0	1.1	1.1	1.3	1.1	1.1	1.2
20-24	3.7	2.9	2.9	2.1	2.3	1.7	1.6	1.5	1.5	1.6	1.6	1.6	1.7	1.5	1.6	1.6	1.5	1.4
25-29	4.3	3.1	3.6	2.4	2.2	1.6	1.5	1.5	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2
30-34	4.1	3.2	3.7	3.0	2.4	1.9	1.8	1.8	1.4	1.4	1.6	1.5	1.3	1.5	1.3	1.3	1.4	1.3
35-39	4.9	4.9	3.9	3.8	3.5	2.7	2.3	2.2	2.2	2.2	2.3	2.0	2.1	2.0	2.1	2.0	2.0	2.0
40-44	6.0	6.0	5.4	5.0	4.8	4.2	4.0	3.2	3.3	3.4	3.5	3.5	3.4	3.2	3.6	3.3	3.1	3.3
45-49	7.0	7.6	7.8	7.3	7.1	6.5	6.5	5.9	6.1	5.6	5.8	5.7	5.5	5.9	5.8	5.8	5.6	5.5
50-54	10.5	10.1	11.2	11.0	11.6	10.4	10.6	10.3	10.1	10.2	10.0	9.9	10.4	9.9	9.9	9.3	9.2	9.4
55-59	16.0	15.1	16.8	15.6	16.6	15.8	17.6	16.4	16.2	16.2	16.1	16.3	15.9	16.0	16.3	15.8	15.5	15.2
60-64	23.3	25.5	23.7	25.4	26.1	24.1	26.1	25.6	25.6	26.0	26.1	26.3	26.5	24.8	25.4	24.9	24.3	24.9
65-69	34.4	40.8	38.1	38.7	38.4	38.1	37.0	39.5	37.7	38.0	39.1	37.0	38.5	38.6	39.1	39.4	39.3	38.8
70-74	61.2	66.6	56.2	63.0	59.6	54.9	55.6	57.0	59.0	57.8	58.8	56.6	57.7	56.6	55.8	56.1	55.3	59.4
75-79	93.9	108.2	93.0	96.4	97.9	87.2	91.9	88.3	86.3	86.7	90.0	83.9	87.8	85.7	85.8	83.7	78.6	79.3
80-84	138.2	164.4	142.9	159.0	147.6	132.8	136.3	135.7	129.2	129.2	129.9	124.4	135.6	132.2	128.1	130.9	128.5	130.9
85+	239.5	268.1	246.1	255.6	253.4	233.6	240.2	226.6	215.8	217.9	224.5	206.3	224.7	224.7	215.5	219.0	219.9	213.0
Geometric Mean	13.5	12.8	11.9	10.8	10.5	8.9	8.6	8.0	7.5	7.5	7.7	7.3	7.3	7.3	7.3	7.2	7.0	7.0

Female																		
Age Group	1921	1926	1931	1936	1941	1946	1951	1956	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
0-4	24.7	19.8	17.0	13.3	11.3	10.0	7.2	6.0	4.9	4.9	4.7	4.2	3.9	3.7	3.6	3.6	3.5	3.4
5-9	2.7	1.9	1.2	1.3	0.9	0.8	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3
10-14	2.0	1.5	1.3	0.7	0.7	0.5	0.5	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3
15-19	2.4	2.2	1.7	1.4	1.0	0.8	0.6	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.5
20-24	3.5	3.0	2.9	2.2	1.4	1.1	0.7	0.5	0.5	0.5	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.4
25-29	4.3	3.2	3.0	2.5	1.7	1.3	0.9	0.7	0.7	0.7	0.7	0.6	0.5	0.6	0.5	0.6	0.6	0.6
30-34	4.5	4.1	3.4	3.2	2.0	1.7	1.1	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.7	0.8	0.8
35-39	5.6	4.6	4.5	3.4	2.8	2.3	1.9	1.3	1.3	1.2	1.3	1.1	1.2	1.2	1.3	1.2	1.2	1.2
40-44	6.2	5.3	4.5	4.4	3.8	3.0	2.8	2.2	1.9	2.3	2.0	1.9	2.0	2.0	2.0	2.0	2.0	1.9
45-49	7.5	7.1	6.4	5.9	5.6	5.0	4.3	3.6	3.3	3.5	3.3	3.0	3.3	3.3	3.0	3.1	3.5	3.1
50-54	10.3	9.2	8.7	8.9	7.7	6.7	5.8	5.8	5.3	5.2	5.4	5.2	5.4	5.1	4.8	5.0	4.9	4.9
55-59	13.9	14.6	13.3	12.6	12.2	10.9	10.1	9.0	7.9	8.1	8.0	8.0	7.9	7.8	7.7	7.7	7.7	7.6
60-64	20.9	22.4	20.4	20.9	18.0	16.0	16.2	14.3	12.3	12.8	12.7	12.7	12.3	12.5	12.0	12.0	11.6	10.7
65-69	34.7	35.5	30.3	32.9	30.0	26.1	25.3	22.1	21.4	21.2	20.3	19.6	19.1	18.8	18.9	18.4	18.3	18.5
70-74	56.9	52.9	48.5	54.1	47.1	43.5	40.9	37.2	33.8	35.0	34.6	33.0	32.6	30.8	30.5	30.5	29.0	29.3
75-79	88.8	92.5	88.3	86.0	79.9	72.1	72.9	67.2	61.0	58.3	58.9	55.8	56.1	55.7	51.3	50.0	49.0	49.0
80-84	134.0	145.7	132.1	155.0	132.7	118.2	120.0	112.8	104.8	104.0	103.2	96.4	96.6	92.4	93.1	92.6	88.5	87.9
85+	243.2	271.0	226.8	251.7	231.0	217.5	212.2	202.0	193.7	196.2	192.7	174.9	189.7	179.5	177.6	184.3	182.5	184.6
Geometric Mean	12.9	11.7	10.3	9.5	7.8	6.7	5.7	4.7	4.3	4.2	4.3	4.0	4.1	4.1	4.0	3.9	3.9	3.9

Table C—Life Expectancy, by Age and Sex, Ontario, 1931-1966

Male										
Age	1930-32	1940-42	1950-52	1955-57	1960-62	1965-67	Age	1930-32	1940-42	1950-52
0	61.30	64.55	66.87	67.80	68.32	68.71	40	31.56	31.54	32.03
1	65.05	66.74	68.34	68.76	69.14	69.29	41	30.71	30.66	31.13
2	64.60	66.11	67.51	67.89	68.24	68.38	42	29.87	29.79	30.24
3	63.87	65.18	66.62	66.97	67.31	67.44	43	29.03	28.93	29.36
4	63.06	64.31	65.71	66.04	66.38	66.50	44	28.20	28.07	28.48
5	62.20	63.42	64.78	65.10	65.42	65.54	45	27.37	27.22	27.62
6	61.33	62.52	63.83	64.15	64.45	64.57	46	26.55	26.37	26.76
7	60.46	61.60	62.88	63.20	63.49	63.61	47	25.73	25.53	25.91
8	59.57	60.68	61.94	62.24	62.52	62.64	48	24.92	24.70	25.08
9	58.68	59.74	60.98	61.27	61.55	61.66	49	24.11	23.88	24.26
10	57.78	58.81	60.03	60.31	60.58	60.69	50	23.32	23.08	23.45
11	56.86	57.87	59.07	59.34	59.60	59.71	51	22.53	22.30	22.65
12	55.95	56.92	58.11	58.37	58.63	58.73	52	21.76	21.52	21.86
13	55.03	55.98	57.15	57.40	57.66	57.76	53	20.99	20.77	21.10
14	54.11	55.04	56.20	56.44	56.70	56.79	54	20.24	20.02	20.34
15	53.20	54.11	55.25	55.48	55.74	55.83	55	19.49	19.29	19.60
16	52.31	53.19	54.31	54.54	54.78	54.88	56	18.76	18.56	18.88
17	51.42	52.27	53.37	53.60	53.84	53.94	57	18.04	17.85	18.17
18	50.54	51.37	52.44	52.66	52.89	53.00	58	17.33	17.15	17.48
19	49.66	50.47	51.51	51.73	51.96	52.07	59	16.63	16.46	16.80
20	48.79	49.57	50.58	50.81	51.03	51.14	60	15.94	15.79	16.15
21	47.93	48.67	49.66	49.89	50.10	50.21	61	15.26	15.13	15.50
22	47.07	47.78	48.74	48.96	49.17	49.29	62	14.59	14.48	14.87
23	46.21	46.88	47.82	48.04	48.25	48.37	63	13.94	13.85	14.26
24	45.35	45.99	46.89	47.12	47.32	47.44	64	13.30	13.23	13.66
25	44.50	45.09	45.97	46.19	46.39	46.51	65	12.67	12.63	13.07
26	43.64	44.18	45.04	45.27	45.46	45.58	66	12.06	12.04	12.48
27	42.78	43.27	44.10	44.33	44.52	44.64	67	11.47	11.46	11.91
28	41.92	42.36	43.17	43.40	43.58	43.70	68	10.89	10.90	11.35
29	41.05	41.44	42.23	42.47	42.64	42.76	69	10.33	10.35	10.80
30	40.19	40.52	41.29	41.53	41.69	41.81	70	9.79	9.82	10.26
31	39.32	39.61	40.36	40.60	40.75	40.86	71	9.25	9.30	9.73
32	38.45	38.69	39.42	39.66	39.80	39.91	72	8.74	8.79	9.22
33	37.58	37.78	38.49	38.73	38.86	38.97	73	8.24	8.30	8.72
34	36.71	36.88	37.56	37.79	37.92	38.02	74	7.77	7.83	8.25
35	35.85	35.97	36.63	36.86	36.98	37.08	75	7.32	7.39	7.80
36	34.98	35.07	35.70	35.93	36.04	36.14	76	6.90	6.97	7.37
37	34.12	34.18	34.77	35.00	35.11	35.21	77	6.50	6.57	6.96
38	33.27	33.49	33.85	34.08	34.19	34.28	78	6.12	6.20	6.58
39	32.41	32.41	32.94	33.16	33.27	33.36	79	5.76	5.84	6.22

1955-57	1960-62	1965-67	Age	1930-32	1940-42	1950-52	1955-57	1960-62	1965-67
32.24	32.35	32.44	80	5.42	5.50	5.89	5.81	5.97	5.99
31.32	31.43	31.53	81	5.09	5.16	5.57	5.46	5.63	5.64
30.42	30.52	30.62	82	4.77	4.85	5.28	5.13	5.30	5.32
29.52	29.62	29.72	83	4.47	4.54	5.00	4.82	4.99	5.00
28.62	28.72	28.84	84	4.18	4.26	4.74	4.52	4.70	4.71
27.74	27.84	27.95	85	3.91	3.98	4.50	4.25	4.41	4.43
26.87	26.97	27.08	86	3.66	3.73	4.28	3.98	4.15	4.16
26.02	26.12	26.22	87	3.42	3.49	4.07	3.73	3.89	3.91
25.17	25.27	25.36	88	3.20	3.26	3.88	3.50	3.65	3.67
24.34	24.44	24.52	89	2.99	3.05	3.69	3.28	3.43	3.45
23.52	23.61	23.70	90	2.79	2.85	3.52	3.07	3.21	3.24
22.71	22.80	22.89	91	2.61	2.67	3.37	2.88	3.01	3.04
21.92	22.00	22.09	92	2.44	2.49	3.22	2.70	2.82	2.85
21.14	21.22	21.31	93	2.28	2.33	3.08	2.52	2.64	2.67
20.37	20.45	20.54	94	2.13	2.28	2.95	2.36	2.47	2.51
19.62	19.69	19.78	95	1.99	2.04	2.83	2.21	2.31	2.35
18.88	18.95	19.04	96	1.86	1.91	2.72	2.06	2.15	2.20
18.15	18.23	18.31	97	1.74	1.78	2.62	1.93	2.01	2.06
17.44	17.52	17.60	98	1.63	1.67	2.52	1.79	1.88	1.93
16.75	16.84	16.91	99	1.52	1.56	2.43	1.66	1.75	1.81
16.08	16.17	16.23	100	1.43	1.45	2.34	1.53	1.64	1.69
15.42	15.51	15.57	101	1.33	1.35	2.26	1.40	1.52	1.58
14.79	14.87	14.93	102	1.25	1.25	2.19	1.26	1.42	1.48
14.17	14.25	14.30	103	1.17	1.13	2.09	1.09	1.29	1.38
13.56	13.64	13.69	104	1.09	0.97	1.97	0.80	1.25	1.29
12.97	13.05	13.10	105		0.68	1.83	0.50	1.00	1.21
12.40	12.47	12.52	106			1.71		0.50	1.13
11.84	11.89	11.96	107			1.63			1.05
11.29	11.34	11.42	108			1.40			
10.75	10.80	10.88	109			1.00			
10.23	10.27	10.36	110			0.50			
9.72	9.77	9.86	111						
9.23	9.28	9.36							
8.74	8.81	8.88							
8.27	8.35	8.42							
7.81	7.92	7.97							
7.37	7.49	7.54							
6.95	7.09	7.13							
6.55	6.70	6.73							
6.17	6.33	6.35							

Table C—Life Expectancy, by Age and Sex, Ontario, 1931-1966—Continued

Female										
Age	1930-32	1940-42	1950-52	1955-57	1960-62	1965-67	Age	1930-32	1940-42	1950-52
0	63.92	68.43	71.85	73.57	74.40	75.53	40	32.90	34.11	35.75
1	66.84	70.07	72.91	74.25	74.95	75.87	41	32.05	33.22	34.83
2	66.35	69.32	72.06	73.38	74.04	74.96	42	31.19	32.33	33.92
3	65.57	68.45	71.14	72.45	73.10	74.01	43	30.34	31.45	33.01
4	64.73	67.57	70.21	71.51	72.15	73.05	44	29.50	30.57	32.11
5	63.86	66.64	69.27	70.56	71.19	72.09	45	28.65	29.70	31.22
6	62.97	65.71	68.32	69.59	70.22	71.12	46	27.82	28.84	30.33
7	62.06	64.76	67.36	68.62	69.25	70.15	47	26.99	27.90	29.45
8	61.14	63.81	66.39	67.65	68.27	69.18	48	26.17	27.13	28.58
9	60.21	62.86	65.43	66.68	67.29	68.20	49	25.35	26.29	27.71
10	59.28	61.90	64.46	65.70	66.31	67.22	50	24.54	25.45	26.84
11	58.35	60.94	63.49	64.72	65.33	66.24	51	23.74	24.62	25.98
12	57.42	59.99	62.52	63.75	64.35	65.26	52	22.94	23.80	25.12
13	56.49	59.03	61.54	62.77	63.37	64.28	53	22.15	22.98	24.27
14	55.56	58.07	60.57	61.79	62.38	63.30	54	21.37	22.18	23.43
15	54.64	57.12	59.60	60.82	61.40	62.32	55	20.61	21.39	22.59
16	53.72	56.17	58.63	59.84	60.43	61.34	56	19.85	20.61	21.77
17	52.81	55.23	57.66	58.87	59.45	60.37	57	19.10	19.84	20.95
18	51.91	54.28	56.70	57.90	58.47	59.40	58	18.37	19.08	20.15
19	51.02	53.34	55.73	56.92	57.50	58.43	59	17.65	18.33	19.36
20	50.13	52.40	54.76	55.95	56.53	57.45	60	16.93	17.59	18.59
21	49.25	51.47	53.80	54.98	55.55	56.48	61	16.21	16.85	17.83
22	48.38	50.53	52.83	54.01	54.58	55.51	62	15.51	16.13	17.08
23	47.51	49.60	51.87	53.04	53.61	54.54	63	14.82	15.41	16.35
24	46.65	48.67	50.91	52.08	52.64	53.57	64	14.14	14.71	15.63
25	45.78	47.74	49.95	51.11	51.67	52.60	65	13.47	14.03	14.92
26	44.92	46.82	48.98	50.14	50.70	51.62	66	12.83	13.36	14.23
27	44.06	45.90	48.02	49.18	49.73	50.65	67	12.19	12.71	13.55
28	43.19	44.98	47.06	48.22	48.76	49.68	68	11.58	12.08	12.89
29	42.33	44.06	46.10	47.25	47.80	48.71	69	10.98	11.46	12.24
30	41.47	43.14	45.14	46.29	46.83	47.74	70	10.38	10.85	11.61
31	40.60	42.23	44.19	45.33	45.86	46.77	71	9.80	10.26	10.99
32	39.73	41.31	43.23	44.36	44.90	45.80	72	9.24	9.68	10.39
33	38.87	40.40	42.28	43.40	43.94	44.84	73	8.70	9.13	9.81
34	38.00	39.49	41.34	42.44	42.98	43.87	74	8.18	8.59	9.25
35	37.15	38.58	40.40	41.49	42.02	42.91	75	7.70	8.09	8.72
36	36.29	37.68	39.46	40.53	41.06	41.96	76	7.24	7.61	8.21
37	35.44	36.79	38.53	39.58	40.11	41.00	77	6.82	7.15	7.72
38	34.59	35.89	37.60	38.63	39.16	40.05	78	6.43	6.72	7.26
39	33.75	35.00	36.67	37.68	38.21	39.11	79	6.06	6.31	6.82

1955-57	1960-62	1965-67	Age	1930-32	1940-42	1950-52	1955-57	1960-62	1965-67
36.74	37.27	38.17	80	5.70	5.92	6.40	6.75	6.75	7.27
35.81	36.33	37.23	81	5.37	5.54	6.01	6.35	6.31	6.81
34.88	35.40	36.29	82	5.05	5.19	5.64	5.97	5.89	6.37
33.95	34.47	35.36	83	4.75	4.85	5.29	5.62	5.49	5.96
33.04	33.55	34.44	84	4.46	4.53	4.97	5.29	5.12	5.57
32.13	32.64	33.52	85	4.18	4.24	4.66	4.98	4.77	5.20
31.22	31.73	32.61	86	3.91	3.97	4.37	4.68	4.45	4.85
30.33	30.83	31.70	87	3.65	3.72	4.10	4.41	4.14	4.52
29.44	29.93	30.80	88	3.41	3.48	3.85	4.15	3.85	4.21
28.55	29.04	29.91	89	3.17	3.26	3.61	3.91	3.58	3.92
27.67	28.16	29.02	90	2.95	3.04	3.39	3.69	3.32	3.65
26.80	27.29	28.14	91	2.73	2.83	3.18	3.48	3.09	3.40
25.94	26.42	27.27	92	2.53	2.63	2.98	3.28	2.87	3.16
25.08	25.56	26.41	93	2.34	2.43	2.79	3.09	2.66	2.94
24.23	24.70	25.55	94	2.16	2.25	2.62	2.92	2.47	2.73
23.40	23.86	24.70	95	1.99	2.07	2.46	2.75	2.29	2.54
22.57	23.01	23.86	96	1.83	1.90	2.31	2.60	2.12	2.36
21.75	22.18	23.03	97	1.68	1.74	2.16	2.45	1.97	2.19
20.94	21.36	22.20	98	1.54	1.58	2.03	2.32	1.82	2.03
20.14	20.54	21.39	99	1.41	1.44	1.90	2.19	1.68	1.88
19.35	19.74	20.59	100	1.29	1.30	1.78	2.06	1.55	1.74
18.57	18.95	19.79	101	1.17	1.17	1.66	1.95	1.43	1.62
17.80	18.16	19.01	102	1.07	1.05	1.55	1.83	1.30	1.50
17.04	17.39	18.24	103	0.97	0.94	1.41	1.70	1.18	1.38
16.30	16.64	17.47	104	0.87	0.83	1.26	1.57	1.00	1.28
15.56	15.90	16.72	105		0.72	1.09	1.44	0.83	1.18
14.84	15.17	15.98	106			0.80	1.28	0.50	1.09
14.14	14.46	15.25	107			0.50	1.11		1.01
13.45	13.77	14.53	108				1.00		0.93
12.78	13.09	13.82	109				0.50		
12.12	12.42	13.13	110						
11.48	11.76	12.46							
10.85	11.12	11.80							
10.25	10.50	11.15							
9.67	9.89	10.53							
9.12	9.31	9.93							
8.59	8.75	9.35							
8.09	8.21	8.80							
7.62	7.70	8.27							
7.17	7.21	7.76							

Table D—Infant Mortality Rates, by County, Ontario, 1921-1969

	1921	1926	1931	1936	1941	1946	1951	1956	1961	1962	1963	1964	1965	1966	1967	1968	1969
EASTERN ONTARIO																	
A—Ottawa Valley:																	
Carleton	125.5	115.4	95.2	83.5	53.0	45.4	27.6	30.3	25.0	23.1	25.3	24.2	25.8	22.7	19.3	20.4	18.2
Lanark	102.1	54.9	55.8	48.8	32.8	42.2	43.9	27.5	25.4	29.4	32.0	23.3	21.2	23.0	17.8	15.1	11.4
Prescott	103.5(1)	117.0	81.3	87.4	86.8	64.8	58.2	44.1	31.3	29.3	40.2	29.6	23.1	19.1	24.5	32.4	24.3
Renfrew	101.1	91.4	84.2	66.5	61.3	46.2	44.0	36.4	29.5	36.7	31.5	27.7	28.5	29.3	25.6	24.8	26.2
Russell	(1)	116.4	109.8	85.1	67.0	53.9	46.9	24.1	28.4	41.4	28.6	26.1	17.2	35.7	18.8	41.0	43.2
B—Upper St. Lawrence:																	
Dundas	(2)	74.2	61.8	44.8	65.6	51.5	23.1	40.8	37.1	34.9	35.2	18.7	32.6	36.4	29.8	22.4	12.3
Frontenac	99.0	94.0	73.1	66.2	54.7	38.5	43.0	32.6	26.1	26.2	21.9	23.7	30.4	26.3	24.0	20.5	20.8
Glengarry	(2)	67.8	108.6	39.6	82.7	35.3	66.0	29.8	37.9	35.8	21.5	20.6	19.8	41.5	16.8	24.5	28.5
Grenville	(3)	67.9	69.0	67.0	82.2	72.7	76.9	30.4	13.7	30.5	18.9	15.1	23.8	14.2	22.3	35.8	15.2
Leeds	96.4(3)	71.5	74.0	57.0	58.9	48.2	41.9	32.1	20.3	23.2	20.2	26.7	18.7	13.6	30.6	34.0	15.8
Stormont	91.8(2)	100.2	103.6	71.2	64.9	32.1	35.1	28.2	24.7	30.4	31.2	24.4	23.4	24.1	15.3	18.6	22.0
LAKE ONTARIO																	
Durham	(4)	35.6	57.7	39.7	39.6	32.3	30.7	31.2	25.5	23.8	16.7	16.4	19.8	18.7	24.4	31.4	18.2
Haliburton	158.8	76.0	41.4	83.8	72.0	24.0	28.7	22.3	34.3	13.2	6.2	17.5	37.4	49.5	11.2	34.5	16.7
Hastings	93.4	71.6	77.5	70.2	59.5	43.5	43.0	30.7	21.2	24.1	22.3	25.9	25.0	18.0	25.0	23.0	24.0
Lennox and Addington	46.2	92.5	77.2	78.4	89.6	60.6	35.5	24.0	15.7	19.2	21.3	20.1	20.4	10.9	6.8	26.6	6.4
Northumberland	88.3(4)	67.5	78.9	60.3	49.0	50.7	13.4	22.9	32.3	22.4	28.8	21.8	13.8	18.5	26.6	12.4	23.4
Peterborough	80.8	63.2	62.7	63.8	37.5	22.1	35.3	27.1	21.2	29.4	20.9	13.3	19.0	20.5	17.5	14.9	14.6
Prince Edward	87.1	56.5	50.2	43.5	67.4	56.2	29.5	25.7	19.5	27.7	11.5	31.1	25.2	15.6	31.1	24.5	13.6
Victoria	99.8	59.3	59.8	66.7	44.8	32.1	35.8	19.9	24.0	25.6	24.3	25.1	24.7	22.9	17.9	12.2	18.3
CENTRAL ONTARIO																	
Halton	89.1	82.0	40.8	47.3	36.6	42.8	23.2	15.6	17.9	21.6	20.7	22.5	16.9	14.7	22.7	16.5	16.0
Ontario	92.7	75.1	67.4	53.1	41.8	26.9	29.3	25.2	22.1	23.4	20.8	23.8	16.5	17.6	18.7	17.2	13.5
Peel	95.6	78.8	30.8	35.7	22.5	30.9	27.1	22.8	18.8	20.7	21.5	17.9	21.0	17.5	15.1	16.0	15.9
York	89.5	71.1	64.3	45.5	34.6	30.0	24.0	20.9	20.3	20.3	19.5	18.9	17.8	18.5	17.6	16.6	14.6
NIAGARA																	
A—Burlington:																	
Brant	61.9	67.9	60.2	51.6	49.6	47.7	25.9	23.5	21.1	19.7	19.8	22.8	16.2	19.5	20.9	19.5	21.2
Wentworth	90.1	68.1	61.2	41.6	34.6	30.7	31.0	22.2	17.8	20.9	16.9	18.8	18.8	16.8	16.4	16.6	17.2
B—Niagara:																	
Haldimand	48.2	58.5	62.7	22.6	39.5	30.0	29.0	24.4	18.9	29.6	15.5	18.0	8.8	15.0	29.1	16.3	10.8
Lincoln	87.2	66.3	43.0	59.2	34.7	43.0	22.1	22.6	16.1	19.8	19.6	17.0	19.2	20.8	17.8	24.0	13.1
Welland	99.2	73.7	66.4	42.7	44.7	34.1	27.3	23.5	20.4	27.6	24.4	20.5	19.4	19.2	17.4	15.7	15.2
LAKE ERIE																	
Elgin	78.1	67.5	66.4	53.1	45.8	36.5	20.7	16.0	20.0	22.0	22.6	25.5	25.5	10.4	17.3	14.7	19.2
Middlesex	87.0	64.0	54.7	52.6	34.1	35.4	24.7	24.4	24.6	23.2	28.6	21.0	18.5	23.4	16.5	18.3	17.8
Norfolk	95.7	50.8	74.1	38.4	50.3	41.9	34.2	11.4	28.2	28.6	23.4	25.6	20.2	29.4	25.7	9.6	20.8
Oxford	83.6	58.3	48.1	45.8	47.7	30.5	24.1	22.9	16.7	22.3	26.5	16.8	18.1	30.0	17.6	16.2	8.9

(1) Russell included with Prescott

(2) Dundas and Glengarry included with Stormont

(3) Grenville included with Leeds

(4) Durham included with Northumberland

Table D—Infant Mortality Rates, by County, Ontario, 1921-1969—Continued

	1921	1926	1931	1936	1941	1946	1951	1956	1961	1962	1963	1964	1965	1966	1967	1968	1969
LAKE ST. CLAIR																	
A—Border:																	
Essex	83.4	91.6	64.1	43.8	31.7	38.1	32.6	25.7	23.9	20.5	21.7	24.2	22.1	21.4	22.4	23.0	25.6
Kent	85.3	73.8	74.8	43.6	45.2	36.9	26.0	25.1	22.6	22.8	22.7	24.4	25.3	22.0	17.2	24.2	23.0
B—Lambton:																	
Lambton	89.2	64.1	59.9	51.3	40.4	36.6	29.9	18.7	23.9	19.2	19.6	23.6	19.1	24.2	23.9	18.5	19.2
MIDWESTERN ONTARIO																	
Huron	56.8	73.4	51.9	36.5	31.3	24.6	32.8	22.7	23.3	16.3	29.9	19.2	22.1	17.0	19.1	9.0	23.3
Perth	73.6	64.2	60.5	35.5	41.8	43.7	34.8	24.4	29.2	18.0	24.7	14.1	20.7	20.8	24.0	19.4	21.2
Waterloo	73.8	55.9	48.8	40.7	33.5	32.7	21.8	20.5	20.0	18.4	22.8	20.7	18.0	19.6	21.2	18.3	19.3
Wellington	84.9	76.9	63.4	46.9	54.1	30.7	35.5	23.7	31.1	17.2	20.0	19.3	17.6	25.9	23.6	20.6	15.0
GEORGIAN BAY																	
A—Blue Water:																	
Bruce	95.0	54.0	66.7	75.0	47.1	39.6	35.9	17.1	31.1	27.8	26.0	22.0	23.8	13.3	15.6	13.9	20.8
Dufferin	98.3	70.9	78.2	24.0	31.6	42.7	27.4	36.3	31.5	32.5	25.9	20.8	25.5	21.0	22.7	24.9	20.3
Grey	69.8	51.9	73.8	48.3	43.6	43.6	37.4	21.4	15.5	25.8	18.0	21.9	29.5	25.3	18.1	23.2	19.0
Simcoe	89.8	76.6	71.7	39.3	52.0	33.3	29.8	28.7	33.5	21.3	29.1	24.0	22.5	23.9	19.3	22.2	24.5
B—Highlands:																	
Muskoka	59.3	56.6	58.2	68.8	74.0	46.2	35.4	19.7	28.1	24.2	14.8	16.3	6.9	16.6	14.5	13.6	9.0
Parry Sound	80.1	59.7	79.7	47.8	62.6	40.2	37.3	29.3	34.7	12.2	30.1	37.2	19.9	26.5	20.5	25.7	24.9
NORTHEASTERN ONTARIO																	
A—Clay Belt:																	
Cochrane	(5)	135.8	107.8	79.0	59.1	40.4	61.2	31.6	34.7	28.5	33.2	23.7	31.0	15.4	21.8	23.9	20.1
Nipissing	116.3	103.3	88.7	99.2	75.3	51.5	54.7	34.6	26.0	24.2	25.9	19.1	23.8	23.4	18.2	17.4	21.0
Timiskaming	125.0	87.0	92.0	58.7	54.7	54.3	36.0	35.6	35.5	26.3	37.2	32.2	33.3	27.8	33.3	25.0	23.4
B—Nickel Range:																	
Manitoulin	88.6	91.7	94.5	70.0	64.2	45.3	45.3	49.5	22.9	44.8	14.9	12.1	13.3	32.4	39.8	27.8	14.9
Sudbury	80.9	90.8	93.9	81.9	53.6	44.1	34.0	27.5	23.4	29.6	24.3	23.5	22.0	23.4	21.2	20.5	18.1
C—Sault:																	
Algoma	103.6	96.4	60.0	52.9	53.3	49.6	27.7	25.1	22.0	25.8	21.7	24.4	21.3	22.3	25.1	24.1	21.6
NORTHWESTERN ONTARIO																	
Kenora	46.5	108.8	68.8	41.1	46.3	82.4	68.6	62.0	41.7	45.0	35.8	31.8	35.3	25.8	45.1	36.4	37.9
Rainy River	72.8	79.2	86.4	25.3	54.4	39.7	31.3	39.5	41.5	33.1	42.3	29.8	36.2	20.8	26.7	23.9	23.8
Thunder Bay	111.9	88.0	70.0	50.7	58.3	34.4	23.3	31.0	22.5	27.8	28.3	20.8	20.4	19.0	23.3	17.5	15.2

(5) Cochrane not a county in 1921

Table E—Death Rates per 1,000 Population, by Cause, Ontario, 1961-1969

Males										
Causes	Age Groups	1961	1962	1963	1964	1965	1966	1967	1968	1969
Accidental and Violent	1— 4	.44	.47	.39	.34	.37	.40	.42	.34	.29
	5—14	.30	.33	.34	.34	.33	.32	.27	.29	.28
	15—24	.96	.92	1.02	.96	1.03	1.02	1.11	1.09	1.04
	25—34	.76	.85	.87	.83	.78	.88	.85	.83	.84
	35—64	1.04	.96	1.08	.99	1.01	.99	1.02	1.05	.99
	65+	2.09	2.04	2.03	1.97	2.15	2.19	2.17	2.08	2.16
Congenital Malformations	1— 4	.17	.13	.15	.11	.08	.13	.12	.07	.06
	5—14	.04	.03	.04	.03	.02	.02	.03	.02	.02
	15—24	.03	.02	.03	.03	.04	.02	.02	.02	.02
	25—34	.02	.02	.03	.03	.02	.02	.02	.01	.01
	35—64	.02	.03	.03	.03	.03	.02	.02	.02	.02
	65+	.03	.03	.04	.03	.01	.03	.05	.06	.05
Neoplasms	1— 4	.12	.11	.13	.15	.09	.09	.15	.09	.15
	5—14	.10	.08	.08	.07	.08	.07	.08	.08	.07
	15—24	.10	.12	.09	.09	.11	.11	.09	.08	.09
	25—34	.19	.20	.19	.16	.13	.15	.14	.15	.17
	35—64	1.71	1.76	1.78	1.72	1.69	1.78	1.76	1.72	1.85
	65+	11.68	11.96	11.70	11.81	11.87	12.28	12.98	12.45	13.35
Nervous System Disease	1— 4	.07	.09	.07	.07	.04	.05	.05	.04	N.A.*
	5—14	.02	.05	.02	.02	.02	.03	.03	.02	N.A.
	15—24	.05	.03	.03	.04	.04	.03	.04	.02	N.A.
	25—34	.05	.07	.05	.05	.08	.06	.07	.04	N.A.
	35—64	.58	.56	.52	.57	.50	.50	.53	.50	N.A.
	65+	10.28	10.56	10.29	9.53	10.11	9.60	9.13	8.89	N.A.
Circulatory System Disease (Heart Disease)	1— 4	.00	.00	.00	.01	.00	.00	.00	.00	.00
	5—14	.01	.00	.01	.00	.00	.01	.01	.01	.00
	15—24	.04	.03	.03	.02	.03	.02	.03	.03	.02
	25—34	.13	.13	.16	.14	.15	.10	.10	.09	.14
	35—64	4.16	4.14	4.08	4.15	4.23	4.05	4.13	3.84	4.12
	65+	36.45	36.07	36.86	35.44	37.26	36.29	35.35	35.27	42.61
Respiratory System Disease	1— 4	.13	.16	.24	.15	.14	.12	.15	.10	.07
	5—14	.03	.03	.03	.03	.03	.02	.03	.03	.03
	15—24	.03	.04	.04	.03	.04	.04	.03	.02	.03
	25—34	.04	.04	.05	.06	.03	.05	.03	.04	.03
	35—64	.31	.32	.35	.33	.14	.36	.40	.39	.41
	65+	4.33	4.55	6.04	4.57	5.64	6.03	5.79	6.39	6.14

*Category changed in 1969

Table E—Death Rates per 1,000 Population, by Cause, Ontario, 1961-1969—Continued

		Females								
Causes	Age Groups	1961	1962	1963	1964	1965	1966	1967	1968	1969
Accidental and Violent	1— 4	.29	.29	.26	.22	.28	.27	.28	.28	.20
	5—14	.12	.11	.15	.13	.13	.16	.17	.14	.12
	15—24	.22	.22	.26	.23	.25	.25	.30	.29	.29
	25—34	.20	.23	.23	.23	.19	.22	.23	.23	.24
	35—64	.29	.31	.32	.33	.37	.37	.37	.39	.40
	65+	1.63	1.80	1.57	1.34	1.56	1.38	1.43	1.37	1.29
Congenital Malformations	1— 4	.12	.13	.14	.11	.12	.08	.11	.11	.15
	5—14	.04	.03	.03	.03	.02	.03	.04	.03	.03
	15—24	.03	.02	.01	.02	.02	.01	.02	.01	.01
	25—34	.02	.02	.01	.02	.02	.02	.02	.02	.01
	35—64	.02	.02	.02	.02	.02	.03	.02	.02	.02
	65+	.03	.03	.02	.03	.04	.02	.02	.01	.03
Neoplasms	1— 4	.09	.09	.09	.09	.10	.11	.09	.08	.07
	5—14	.05	.07	.07	.06	.05	.06	.07	.05	.07
	15—24	.06	.05	.08	.06	.06	.07	.07	.06	.05
	25—34	.16	.18	.23	.18	.14	.16	.15	.14	.14
	35—64	1.62	1.71	1.64	1.60	1.73	1.63	1.68	1.63	1.70
	65+	7.55	7.70	7.70	7.50	7.71	7.38	7.50	7.38	7.63
Nervous System Disease	1— 4	.06	.04	.03	.02	.04	.05	.04	.04	N.A.*
	5—14	.03	.03	.01	.02	.01	.02	.02	.01	N.A.
	15—24	.02	.03	.03	.03	.02	.02	.02	.01	N.A.
	25—34	.08	.04	.05	.04	.03	.05	.03	.04	N.A.
	35—64	.52	.47	.47	.50	.44	.44	.38	.39	N.A.
	65+	11.11	10.36	10.03	9.22	9.70	9.05	8.33	8.27	N.A.
Circulatory System Disease (Heart Disease)	1— 4	.00	.01	.00	.00	.01	.00	.00	.00	.01
	5—14	.01	.00	.00	.00	.01	.01	.01	.01	.01
	15—24	.03	.03	.03	.01	.03	.02	.01	.01	.02
	25—34	.07	.09	.05	.08	.07	.08	.05	.04	.09
	35—64	1.29	1.32	1.29	1.27	1.23	1.26	1.20	1.20	1.51
	65+	26.08	26.30	26.50	25.82	25.73	25.02	25.00	24.69	31.68
Respiratory System Disease	1— 4	.12	.17	.14	.13	.11	.12	.10	.08	.09
	5—14	.03	.02	.04	.02	.02	.03	.03	.02	.02
	15—24	.02	.01	.02	.02	.03	.02	.02	.03	.03
	25—34	.05	.03	.05	.02	.03	.04	.02	.03	.04
	35—64	.12	.13	.17	.14	.14	.16	.15	.14	.19
	65+	2.74	2.94	3.39	2.35	2.80	2.93	2.63	3.11	2.84

*Category changed in 1969

Table F—Causes of Death, by Sex and Region, Ontario, 1966

			Total	Rate per		Rate per		Rate per		Rate per		Rate per
			Ontario	100,000	Eastern	100,000	Lake	100,000	Central	100,000	Niagara	100,000
			Pop'n	Pop'n	Ontario	Pop'n	Ontario	Pop'n	Ontario	Pop'n	Pop'n	Pop'n
I	Infective & Parasitic Diseases	T	54,171	778.22	6,839	803.72	3,132	892.55	17,648	705.37	6,666	793.40
		M	31,142	895.10	3,820	902.12	1,782	1,014.32	9,912	799.42	3,820	911.80
		F	23,029	661.43	3,019	706.24	1,350	770.47	7,736	612.96	2,846	675.64
		T	304	4.37	46	5.41	18	5.13	93	3.72	35	4.17
		M	182	5.23	23	5.43	11	6.26	59	4.76	21	5.01
		F	122	3.50	23	5.38	7	4.00	34	2.69	14	3.32
		T	132	1.90	20	2.35	7	1.99	38	1.52	10	1.19
		M	79	2.27	8	1.89	5	2.85	25	2.02	7	1.67
		F	53	1.52	12	2.81	2	1.14	13	1.03	3	0.71
	A6-11 Venereal Diseases	T	35	0.50	3	0.35	2	0.57	10	0.40	8	0.95
		M	23	0.66	1	0.24	1	0.57	8	0.65	4	0.95
		F	12	0.34	2	0.47	1	0.57	2	0.16	4	0.95
	A12-43 Other	T	137	1.97	23	2.70	9	2.56	45	1.80	17	2.02
		M	80	2.30	14	3.31	5	2.85	26	2.10	10	2.39
		F	57	1.64	9	2.11	4	2.28	19	1.51	7	1.66
II	Malignant Neoplasms	T	9,607	138.01	1,129	132.68	489	139.35	3,499	139.85	1,203	143.18
		M	5,272	151.53	589	139.10	275	156.53	1,878	151.46	680	162.31
		F	4,335	124.51	540	126.32	214	122.13	1,621	128.44	523	124.16
III & IV	Allergic Disorders & Endocrine, & Metabolic & Blood Diseases	T	1,272	18.27	140	16.45	84	23.94	380	15.19	177	21.07
		M	617	17.73	67	15.82	42	23.91	187	15.08	80	19.10
		F	655	18.81	73	17.08	42	23.97	193	15.29	97	23.03
V	Mental Psychoneurotic & Personality Disorders	T	181	2.60	24	2.82	10	2.85	66	2.64	20	2.38
		M	108	3.10	15	3.54	4	2.28	36	2.90	12	2.86
		F	73	2.10	9	2.11	6	3.42	30	2.38	8	1.90
VI	Diseases of the Nervous System & Sense Organs	T	6,491	93.25	783	92.02	461	131.38	1,963	78.46	871	103.67
		M	3,047	87.58	379	89.50	218	124.09	865	69.76	407	97.15
		F	3,444	98.92	404	94.51	243	138.68	1,098	87.00	464	110.15
VII	Diseases of the Circulatory System	T	23,032	330.88	2,966	348.56	1,317	375.32	7,502	299.85	2,780	330.88
		M	13,644	392.16	1,679	396.51	793	451.38	4,370	352.45	1,637	390.74
		F	9,388	269.64	1,287	301.07	524	299.06	3,132	248.16	1,143	271.35
VIII	Diseases of the Respiratory System	T	3,402	48.87	498	58.52	213	60.70	1,034	41.33	411	48.92
		M	2,136	61.39	283	66.83	117	66.60	668	53.88	257	61.34
		F	1,266	36.36	215	50.30	96	54.79	366	29.00	154	36.56
IX	Diseases of the Digestive System	T	1,959	28.14	268	31.50	91	25.93	671	26.82	265	31.54
		M	1,102	31.67	147	34.72	41	23.34	369	29.76	146	34.85
		F	857	24.61	121	28.31	50	28.54	302	23.93	119	28.25
X	Diseases of the Genito-Urinary System	T	806	11.58	96	11.28	49	13.96	239	9.55	94	11.19
		M	495	14.23	61	14.41	33	18.78	143	11.53	56	13.37
		F	311	8.93	35	8.19	16	9.13	96	7.61	38	9.02
XI	Deliveries & Complications of Pregnancy, Childbirth and the Puerperium	T	36	0.52	2	0.24	2	0.57	11	0.44	4	0.48
		M	—	—	—	—	—	—	—	—	—	—
		F	36	1.03	2	0.47	2	1.14	11	0.87	4	0.95
XII & XIII	Diseases of the Skin & Musculo-skeletal System	T	213	3.06	29	3.41	12	3.42	72	2.88	33	3.93
		M	86	2.47	8	1.89	7	3.98	26	2.10	16	3.82
		F	127	3.65	21	4.91	5	2.85	46	3.64	17	4.04

Lake Erie	Rate per 100,000 Pop'n	Lake St. Clair	Rate per 100,000 Pop'n	Mid-western Ontario	Rate per 100,000 Pop'n	Georgian Bay	Rate per 100,000 Pop'n	North-eastern Ontario	Rate per 100,000 Pop'n	North-western Ontario	Rate per 100,000 Pop'n
3,853	879.86	4 055	835.11	3,467	814.28	3,286	1,002.00	3,468	671.80	1,757	786.19
2,173	1,003.81	2,405	990.49	1,945	910.62	1,864	1,122.59	2,261	850.38	1,160	996.81
1,680	758.69	1,650	679.70	1,522	717.30	1,422	878.33	1,207	482.13	597	557.36
27	6.17	18	3.71	12	2.82	9	2.74	29	5.62	17	7.61
19	8.78	8	3.29	6	2.81	5	3.01	19	7.15	11	9.45
8	3.61	10	4.12	6	2.83	4	2.47	10	3.99	6	5.60
12	2.74	9	1.85	5	1.17	4	1.22	19	3.68	8	3.58
7	3.23	4	1.65	2	0.94	3	1.81	13	4.89	5	4.30
5	2.26	5	2.06	3	1.41	1	0.62	6	2.40	3	2.80
4	0.91	1	0.21	2	0.47	1	0.30	3	0.58	1	0.45
3	1.39	—	—	2	0.94	1	0.60	2	0.75	1	0.86
1	0.45	1	0.41	—	—	—	—	1	0.40	—	—
11	2.51	8	1.65	5	1.17	4	1.22	7	1.36	8	3.58
9	4.16	4	1.65	2	0.94	1	0.60	4	1.50	5	4.30
2	0.90	4	1.65	3	1.41	3	1.85	3	1.20	3	2.80
606	138.38	683	140.66	600	140.92	499	152.16	599	116.03	300	134.24
350	161.68	390	160.62	310	145.14	259	155.98	357	134.27	184	158.11
256	115.61	293	120.70	290	136.67	240	148.24	242	96.67	116	108.30
95	21.69	113	23.27	73	17.15	80	24.39	104	20.15	26	11.63
46	21.25	55	22.65	36	16.85	42	25.29	49	18.43	13	11.17
49	22.13	58	23.89	37	17.44	38	23.47	55	21.97	13	12.14
8	1.83	9	1.85	11	2.58	6	1.83	19	3.68	8	3.58
4	1.85	9	3.75	6	2.81	4	2.41	10	3.76	8	6.87
4	1.81	—	—	5	2.36	2	1.24	9	3.59	—	—
529	120.80	462	95.15	483	113.44	436	132.95	326	63.15	177	79.20
244	112.71	243	100.08	221	103.47	196	118.04	176	66.20	98	84.21
285	128.71	219	90.21	262	123.48	240	148.24	150	59.92	79	73.75
1,634	373.14	1,763	363.08	1,459	342.67	1,528	465.93	1,391	269.45	692	309.64
930	429.61	1,061	436.97	843	394.68	905	545.03	941	353.92	485	416.77
704	317.93	702	289.18	616	290.31	623	384.81	450	179.75	207	193.25
248	56.63	269	55.40	202	47.44	196	59.77	197	38.16	134	59.96
157	72.53	184	75.78	125	58.52	114	68.66	146	54.91	85	73.04
91	41.10	85	35.01	77	36.29	82	50.65	51	20.37	49	45.75
130	29.69	152	31.30	119	27.95	77	23.48	123	23.83	63	28.19
69	31.87	87	35.83	77	36.05	45	27.10	82	30.84	39	33.51
61	27.55	65	26.78	42	19.79	32	19.77	41	16.38	24	22.41
67	15.30	60	12.36	58	13.62	52	15.86	64	12.40	27	12.08
34	15.71	34	14.00	38	17.79	33	19.87	45	16.92	18	15.47
33	14.90	26	10.71	20	9.43	19	11.74	19	7.59	9	8.40
2	0.46	2	0.41	1	0.23	1	0.30	8	1.55	3	1.34
—	—	—	—	—	—	—	—	—	—	—	—
2	0.90	2	0.82	1	0.47	1	0.62	8	3.20	3	2.80
12	2.74	18	3.71	11	2.58	10	3.05	10	1.94	6	2.68
3	1.39	9	3.71	2	0.94	6	3.61	6	2.26	3	2.58
9	4.06	9	3.71	9	4.24	4	2.47	4	1.60	3	2.80

[illegible]

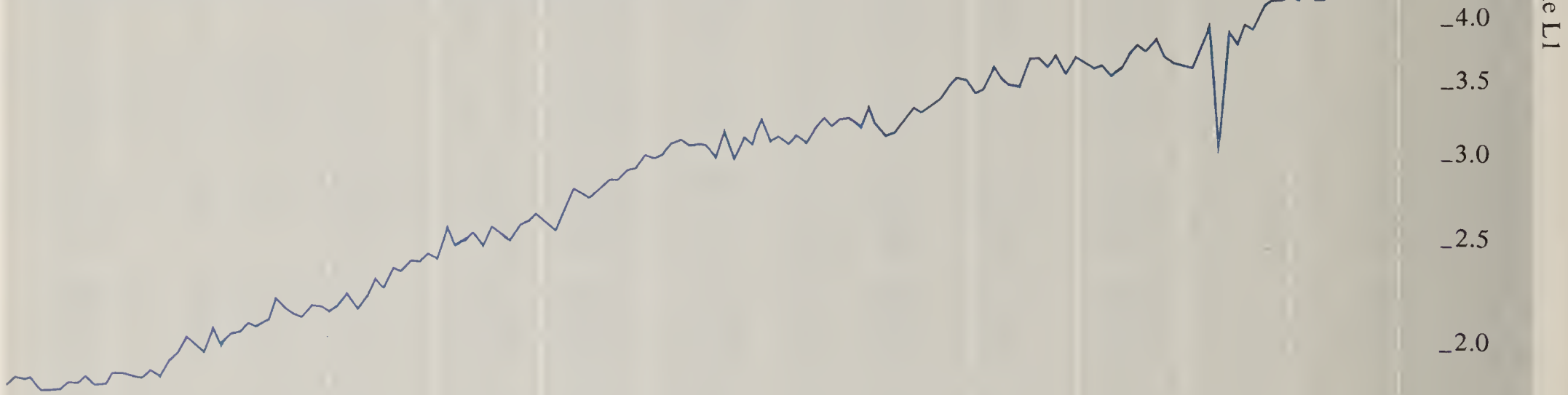
Selected Economic Indicators

Leading Indicators

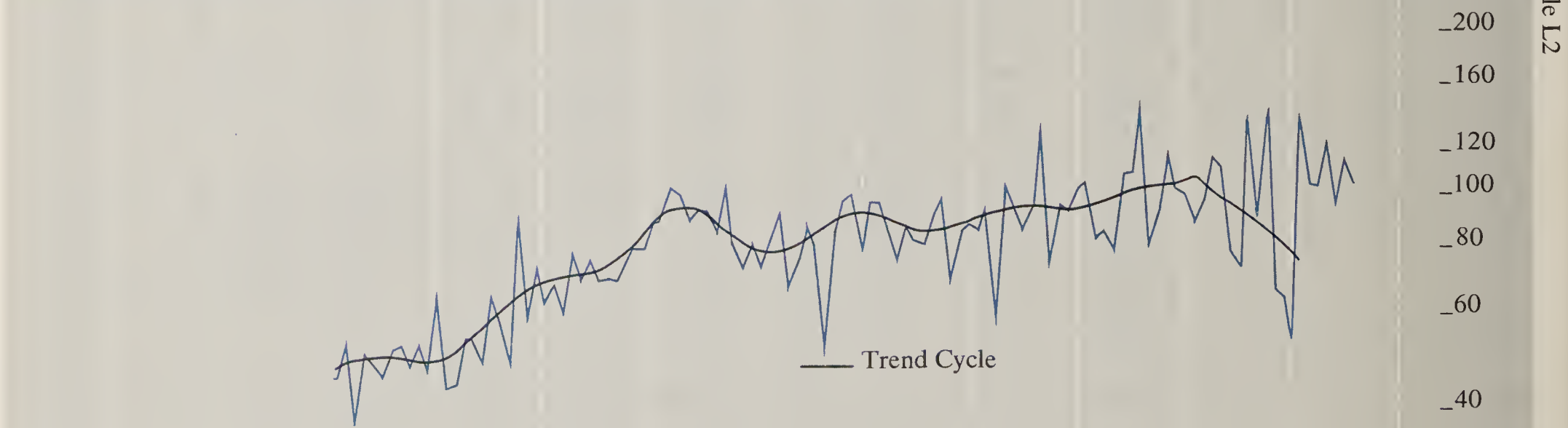
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)

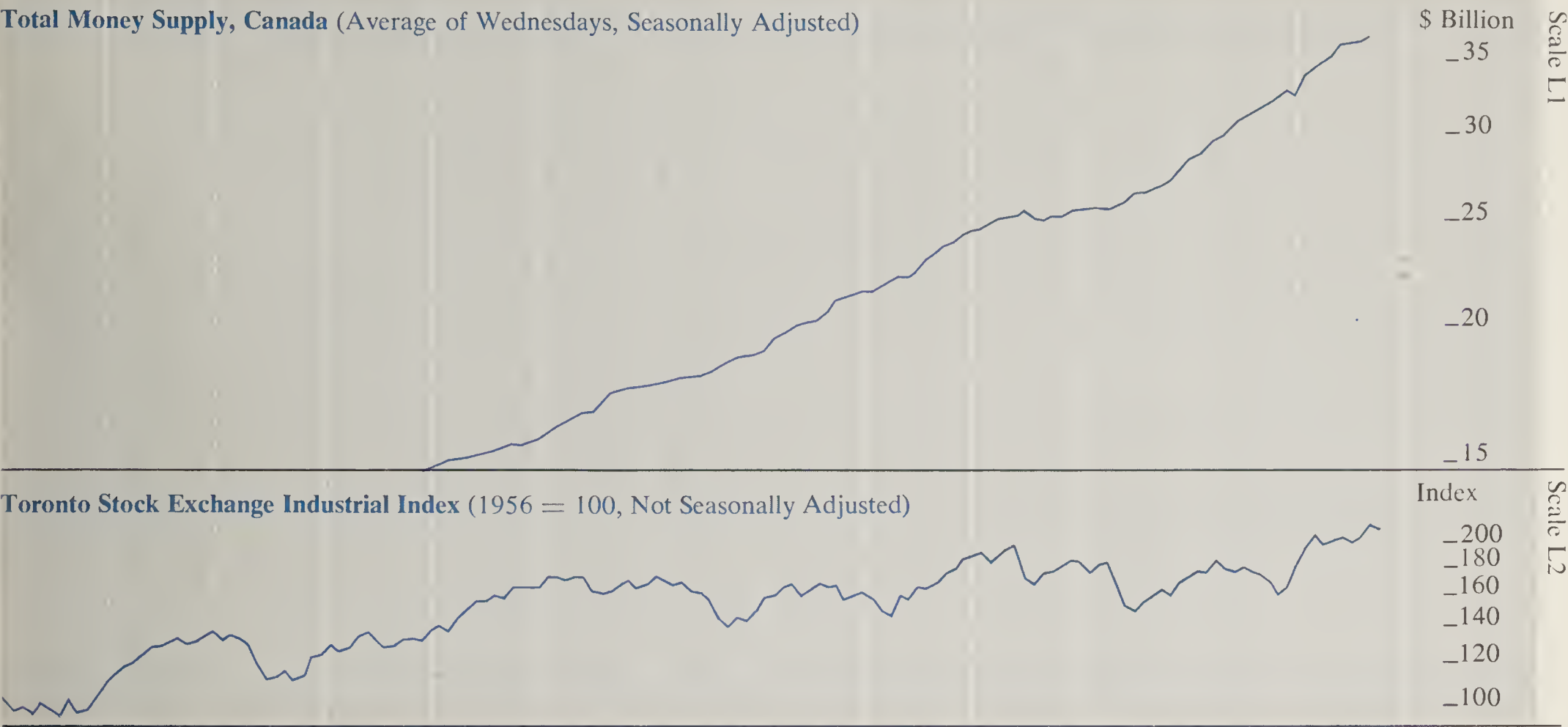


Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

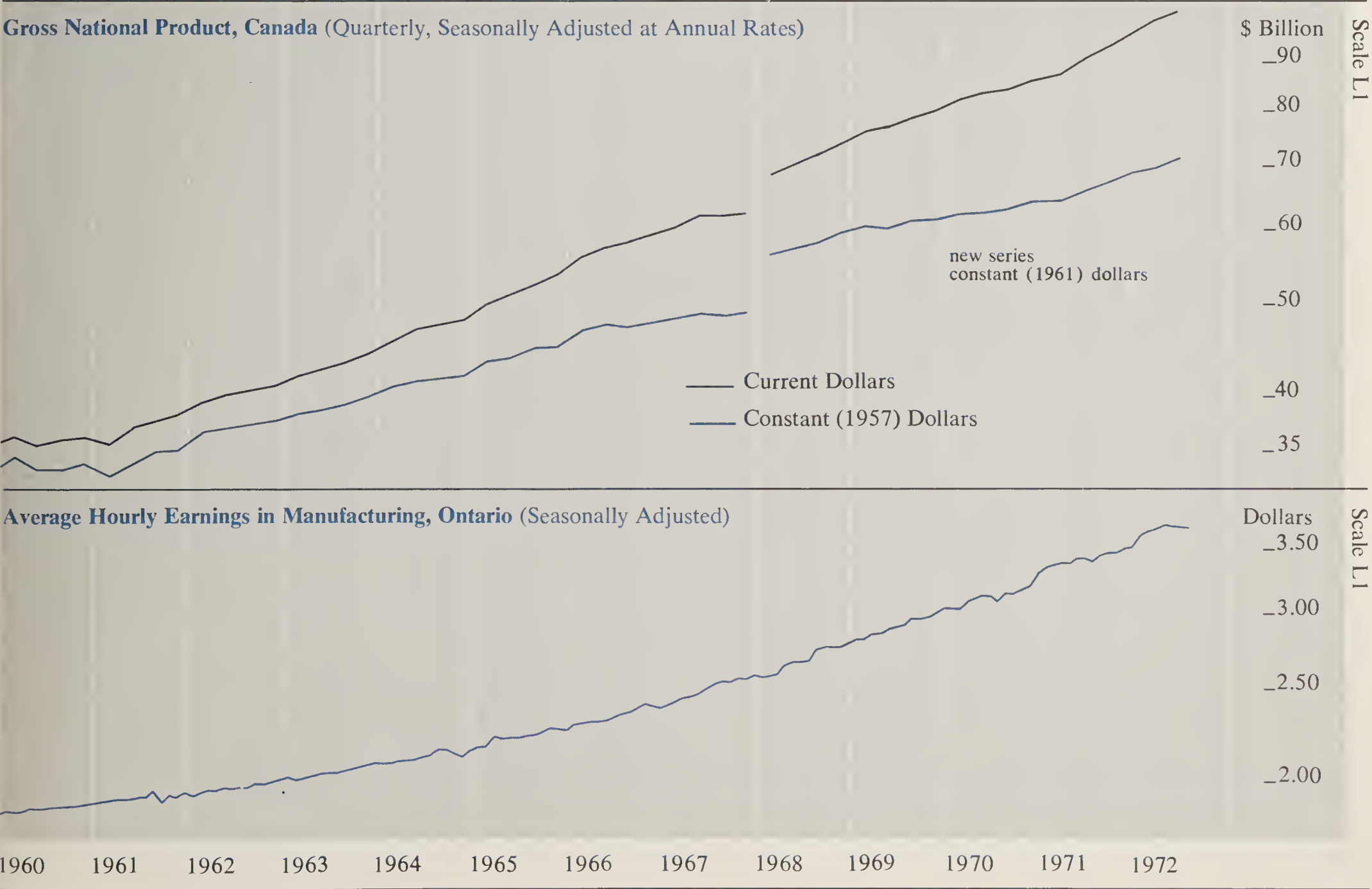


1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

Leading Indicators



Coincidental and Lagging Indicators



Coincidental and Lagging Indicators

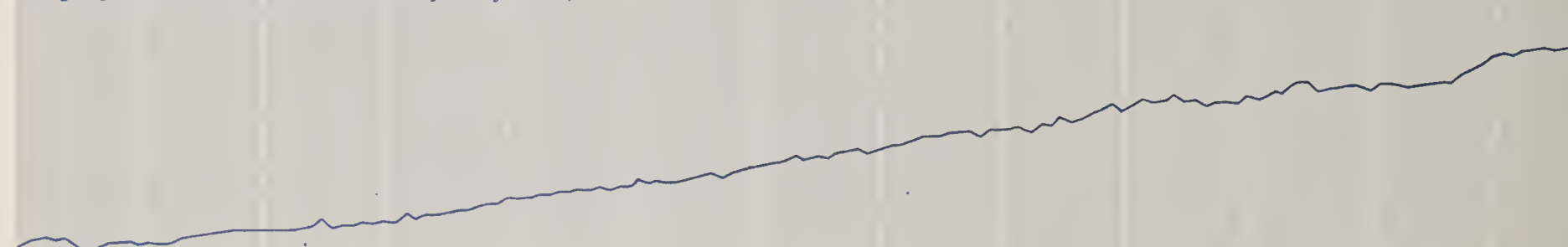
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent
Scale A
_8.0
_7.0
_6.0
_5.0
_4.0
_3.0
_2.0



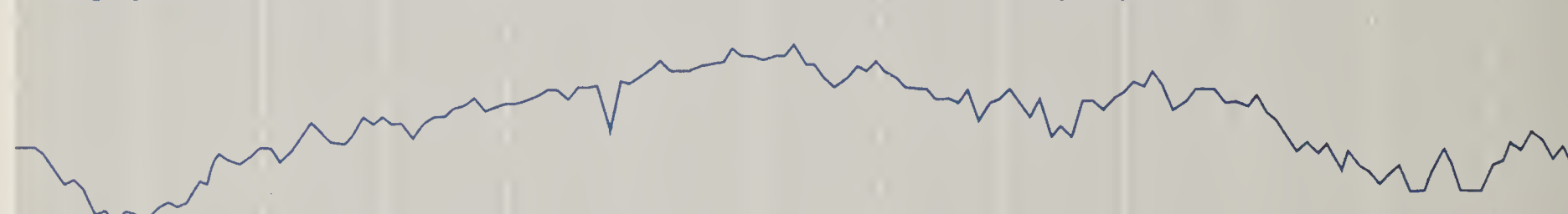
Employment, Ontario (Seasonally Adjusted)

Million
Scale L1
_3.25
_3.00
_2.75
_2.50
_2.25



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)

Per Cent
Scale A
_2.0
_3.0
_4.0
_5.0
_6.0



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index
Scale L2
_400
_300
_200
_100
_70
_50



1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

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Ontario economic review

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Economic Indicators

Seasonally Adjusted

1971															1972											
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.												
Leading Indicators																										
Average Weekly Hours Worked in Manufacturing	39.8	39.8	39.8	40.0	40.0	40.4	40.7	40.1	40.2	40.5	39.7	40.8	40.5													
New Orders in Manufacturing Industries ^c	3,993.7	4,267.3	4,334.7	4,216.9	4,267.0	4,216.1	4,368.1	4,213.4	4,234.7	4,563.0	4,439.8	4,488.0	4,459.5	4,381.7												
Building Permits Issued in Ontario, Non-Residential Construction	92.6	146.2	67.3	64.6	53.1	139.6	103.4	102.5	123.2	95.1	114.7	104.7	76.7													
Urban Housing Starts (Annual Rate)	73,000	99,400	82,900	73,600	98,500	77,500	82,900	123,100	94,000	78,700	108,600	106,700	97,000	82,700												
Money Supply ^c	35,009	35,456	35,978	36,406	36,964	37,423	38,287	38,680	39,120	39,689	40,646	40,774	40,855	41,243												
T.S.E. Industrial Index ^u	177.5	176.3	169.9	160.8	166.2	181.6	197.3	203.6	197.7	200.0	204.0	199.7	204.8	214.1												
Business Failures ^u	60	55	40	78	94	61	44	61	135	78	153	94	—	101												
Business Failures — Liabilities ^u	8.0	5.3	2.1	5.6	5.7	3.7	3.4	4.7	8.7	9.0	7.7	4.3	—	7.4												
Coincidental and Lagging Indicators																										
Gross National Product ^c (Annual Rate)			94,644			96,596			99,152			102,092														
Average Hourly Earnings in Manufacturing	3.46	3.47	3.49	3.51	3.52	3.53	3.62	3.66	3.66	3.70	3.69	3.68	3.67													
3-Month Treasury Bill Rate ^{c,u}	3.68	3.79	4.06	3.47	3.24	3.21	3.36	3.45	3.57	3.64	3.73	3.50	3.46	3.50												
Cheques Cashed in Clearing Centres ¹	7,457	7,843	7,988	8,291	8,248	8,098	7,627	7,940	7,508	8,010	7,409	8,144	8,437													
Retail Trade	983	972	1,000	1,001	1,030	1,013	1,033	1,036	1,032	1,085	1,093	1,080	1,102													
Labour Force	3,231	3,244	3,285	3,304	3,321	3,324	3,359	3,325	3,373	3,349	3,372	3,362	3,373	3,392												
Employed	3,081	3,080	3,106	3,118	3,136	3,159	3,197	3,174	3,216	3,208	3,225	3,200	3,221	3,220												
Unemployed	150	164	179	186	185	165	162	151	157	141	147	162	152	172												
Unemployed as % of Labour Force	4.6	5.1	5.4	5.6	5.6	5.0	4.8	4.5	4.7	4.2	4.4	4.8	4.5	5.1												
Wages and Salaries	1,744	1,763	1,775	1,771	1,782	1,786																				
Index of Industrial Employment	132.6	132.2	132.8	132.2	131.2	131.5	131.9	132.1	133.2	133.9	134.8	134.8	134.2	132.3												
Index of Industrial Production ^c	182.5	186.1	188.2	188.1	187.5	187.8	189.4	189.5	191.1	195.1	192.8	194.0	193.8	192.3												
Total Manufacturing ^c	178.7	182.3	185.0	185.6	184.0	184.3	186.1	185.0	187.1	191.0	188.3	190.9	191.4	190.1												
Non-Durables ^c	160.8	162.4	163.8	164.7	163.4	163.7	164.5	162.9	165.4	169.4	167.5	172.0	170.5	169.8												
Durables ^c	201.2	207.5	211.7	212.0	210.1	210.3	213.3	213.1	214.6	218.4	214.6	214.8	217.8	215.7												
Mining ^c	191.2	191.7	191.4	188.1	190.2	190.6	192.2	194.9	193.3	200.8	197.2	189.3	185.5	182.0												
Electric Power and Gas Utilities ^c	202.4	209.7	211.1	209.1	213.3	213.8	213.5	218.8	221.9	221.3	224.3	228.2	228.2	227.8												
Primary Energy Demand (Annual Rate)	67.33	69.82	71.13	68.06	70.26	68.83	70.19	72.37	72.63	72.07	71.74															
Exports (including re-exports) ^c	1,472	1,553	1,517	1,526	1,507	1,508	1,483	1,577	1,553	1,555	1,670	1,749	1,482	1,585												
Imports ^c	1,324	1,378	1,275	1,462	1,387	1,362	1,494	1,443	1,519	1,511	1,534	1,540	1,524	1,521												
Unclassified Indicators																										
Foreign Exchange Reserves ^{c,u}	4,056	4,319	4,308	4,379	4,573	4,852	4,838	4,841	4,903	5,005	5,210	5,376	5,349	5,358												
Industrial Materials Price Index ^{c,u}	266.7	266.8	265.6	266.4	267.9	269.8	277.1	282.8	291.7	290.6	294.5	295.7	294.9	300.9												
Consumer Price Index ^{c,u}	134.1	135.0	134.7	134.9	135.4	136.3	136.7	137.3	137.4	138.2	138.3	138.5	140.2	141.3												
Toronto ^u	130.2	130.6	130.7	130.2	130.5	131.6	132.0	132.8	132.6	133.4	133.4	133.9	135.7	135.9												
Ottawa ^u	131.8	132.0	131.7	131.6	132.3	133.0	133.6	133.9	134.1	135.1	134.7	134.9	136.1	137.4												
Thunder Bay ^u	104.2	104.6	105.2	104.8	104.9	105.4	105.8	106.3	106.3	107.0	107.1	106.6	107.2	108.4												
Purchasing Power of 1961 Consumer Dollar ^{c,u}	0.75	0.74	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71												

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.





Ontario Economic Review

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Volume 10, Number 5

Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics and Intergovernmental Affairs
H. Ian Macdonald, Deputy Minister



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Ontario Economic Review

November/December 1972

Volume 10, Number 5

Federal-Provincial Shared-Cost Programs in Ontario

Taxation and Fiscal Policy Branch,
Ministry of Treasury, Economics and Intergovernmental Affairs

Rates of Return and Taxation from Private Capital in Canada

Glenn P. Jenkins, *Consultant*
Economic Planning Branch

Selected Economic Indicators

A publication of the
Ministry of Treasury, Economics
and Intergovernmental Affairs
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics and
Intergovernmental Affairs*

H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Ministry.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Ministry of Treasury, Economics and Intergovernmental Affairs, Frost Building, Queen's Park, Toronto, Ontario, M7A 1Y7.

During the recent reorganization of the Ministry of Treasury, Economics and Intergovernmental Affairs, two editions of the Ontario Economic Review (November/December 1972 and January/February 1973) were not published.

The November/December edition has now been printed, and preparation of the January/February issue is underway. Publication of these two issues will thereby provide continuity for the Review, and the Review will continue to be published on a bimonthly basis.

About the Review

The absence of the profit motive in the public sector has always made the evaluation of long-range projects more difficult than in the private sector. The criterion for capital investment by private corporations is the profitability of a given project. In the public sector, since social implications are involved, no similar straight-forward criterion exists.

A critical element in any project evaluation is the rate used for discounting future costs and benefits.

Dr. Jenkins's article, featured in the November/December edition of the *Ontario Economic Review*, contributes significantly to the understanding of the problems involved in choosing an appropriate discount rate for the public sector. The article traces the development of the determination of the rates of return to capital of various sectors in the Canadian economy. While these rates were developed on a national basis, they can apply equally to projects undertaken by the Ontario Government, other provincial governments and crown corporations.

The article on shared-cost programs provides a preliminary indication of the number and scope of arrangements between federal and provincial departments which now affect almost all fields of provincial responsibility. It can be seen that cost sharing not only earmarks annually a considerable portion of the Ontario budget but also creates a greatly varied and highly complex set of administrative relationships.

This article was prepared under the direction of Mr. D. M. Allan in the Taxation and Fiscal Policy Branch, Ministry of Treasury, Economics and Intergovernmental Affairs.

Indicator Charts, Pages 20-22

Fluctuations in aggregate economic activity—commonly used to define business cycles—do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate—because they relate to future rather than present production—are referred to as leading indicators, and are widely used to anticipate the short future course of the overall economy. The charts on pages 20, 21 and 22 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used—'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance—only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

Federal-Provincial Shared-Cost Programs in Ontario

Taxation and Fiscal Policy Branch,
Ministry of Treasury, Economics and Intergovernmental Affairs

I—INTRODUCTION

Since 1867 the federal government has assumed the major responsibility for fiscal policy in Canada. One aspect of that function has been the redistribution of fiscal resources and economic activity among governments and regions throughout the country. Over the years this role has commanded a growing proportion of federal budgetary allocations to a point today where transfer policies encompass a considerable range of methods including unconditional grants, tax sharing, regional expansion programs, cost sharing, equalization payments and public works projects. Five major federal policies — equalization, regional economic expansion, statutory subsidies, conditional grants and public works — will alone distribute almost \$5 billion throughout Canada in 1972.

Provinces have been interested both in the magnitude of federal transfers and in the mechanisms involved since they can either strengthen or attenuate the autonomy of provincial governments in the federation. Indeed, Ontario has made comments and suggestions over the last few years on this issue of federal redistributive policy. Both in its annual budget statements¹ and at federal-provincial conferences² the Province has indicated its general concern, along with that of other provinces, for an open and comprehensive assessment of federal programs in this policy area.

A clear trend in federal transfer policy has become evident. There has been a move away from sole reliance upon unconditional financial transfers — statutory subsidies and equalization payments — and a rapid increase in conditional transfers via the shared-cost program mechanism. In 1972, shared-cost payments to the provinces will amount to \$3.2 billion, or 65 per cent of total redistributive spending.

It is not merely the sheer size and expansion of conditional grants that warrant attention. More important, they exert enormous leverage on planning, priority-setting and financing both for the provinces and the national government. They also create serious problems of policy, financial, and administrative control. It is the characteristics of budgetary leverage and operational inflexibility which make conditional grants less suitable than alternative means of transferring revenues, such as tax sharing or unconditional financial transfers. At the same time, shared-cost programs have demonstrated evident merit in terms

of establishing social advances and achieving national levels of essential public services. In light of these advantages and disadvantages, it is appropriate to undertake a periodic stocktaking and evaluation of shared-cost programs.

It is the purpose of a new Ontario Staff Paper³ to examine the budgetary problems that arise from cost sharing in general. In particular, it considers the issues of control, rigidities and accountability. The method followed is to provide a brief history of federal transfers, noting especially the emergence of conditional grants and their distinctive features. This is followed by an evaluation of existing shared-cost programs in Ontario from which several conclusions concerning federal-provincial conditional grants are drawn. An appendix provides a detailed descriptive inventory of the fifty-three joint programs currently in effect.

II—BACKGROUND OF COST SHARING Initial Transfers

Almost from the year of Confederation the central government was called upon to exercise its role as guardian of the economic and fiscal well-being of the provinces. While this was a deliberate aim of the Constitution, few had anticipated that the provinces' revenues would be so inadequate or that their needs would be so explosive as to require almost immediate federal aid.

In this situation, the central government had no clear philosophy to govern its response to provincial requests for more and more financial assistance. The confusion that reigned until the early twentieth century led to federal transfers on the most ad hoc and arbitrary of reasoning, guided by a notion of Victorian frugality. Statutory payments originally had been established on a variety of criteria, all unrelated to the present or future expenditure needs of the provinces or the growing evidence of financial and economic disparities among regions.

Until 1912, additions to these initial subsidies were made largely upon advocacy and rarely upon any objective measure of fiscal need or capacity. In 1912, these unconditional statutory subsidies ceased to grow sporadically and instead were related to a number of factors which provided each province with a basic — though very low — financial floor. There has been little change in this principle since that date.⁴

Cost Sharing

Such a settlement was no solution to the discrepancies between provinces in levels of

services. Nor did it provide sufficient funds to finance the rapid growth in the provinces' responsibilities as a result of emerging welfare statism. Motivated by the problems that differences among provinces in hygiene, farm education, technical training and road quality presented, the federal government established grants to the provinces, conditional upon expenditures in these areas. Between 1912 and 1927, federal funds were made available for provincial programs in these fields. While concerned with specific program areas, these grants still lacked any close relationship to actual program costs or standards. Nonetheless, they did constitute tentative and temporary federal assistance to what clearly were acknowledged to be provincial responsibilities. For this reason, federal control of provincial expenditure was cautious or relaxed. Even in 1927 when the Old Age Pensions Act was legislated by the federal government, the initiative for accepting federal money and formulating legislation was left to the provinces. This new scheme did, however, introduce the idea of federal payments related to provincial expenditure rather than to a flat-rate or per capita sum.

During the Depression in the 1930's, conditional grants failed because their own inflexibility and complexity could not provide an adequate response to soaring provincial and municipal welfare costs. Relief payments and employment projects overwhelmed the administrative capacity required by conditional federal transfers and, consequently, many became unconditional subventions. Out of this chaotic situation, as well as the continuing confusion about the proper federal role in assisting the development of the provinces, emerged the Rowell-Sirois Commission⁵. The Commission concluded in 1940 that programs of joint administration had been unsatisfactory. The system of Dominion auditors and inspectors examining provincial accounts and activities often caused divisions and confusion over the lines of accountability and responsibility. Moreover, financial and administrative control requirements imposed by the federal government raised the question of whether a province could indeed set its own priorities and budgets in these areas.⁶

The issue of provincial autonomy and accountability was set aside during and immediately after the war by the federal government. It felt that for reasons of central economic control neither greater tax room nor larger unconditional grants could

be offered in lieu of joint programs. Instead, a wholly new set of conditional grants was proposed and gradually implemented over the next ten years. Since 1946, there have been major programs in welfare, health, resource development, medical care and support for post-secondary education. Collectively, these shared-cost programs account for 22 per cent of the federal budget in 1972. At the provincial level, these conditional transfers represent a major part of provincial financing, ranging from 20 per cent of total expenditures in Ontario to over 45 per cent in the smallest provinces.

III—PROBLEMS ASSOCIATED WITH CONDITIONAL GRANTS

The 53 shared-cost programs examined in *Federal-Provincial Shared-Cost Programs in Ontario* demonstrate both the merits and drawbacks of joint financing schemes. There can be little doubt that these shared-cost programs have stimulated new or much improved services, particularly in provinces with limited financial resources. Indeed, the attainment of uniform national standards in health, education, welfare and transportation has largely been a result of federal-provincial collaboration and joint financing. Now that the major programs are mature and their initial purposes achieved, however, the question arises whether these conditional transfers should now be replaced by a more flexible and efficient mechanism.

A General Problem

One problem is recurrent in conditional grants: they have a tendency to interfere with a province's priority-setting, budgetary planning and efficiency of program delivery. The more stipulations are attached to federal funds, the more fiscal transfers reduce provincial autonomy. By choosing the area of initiative, the federal government can decide which provincial activity it wishes to stimulate and favour over other provincial priorities. Both federal and provincial governments recognize this. For this reason the central government has long emphasized, as did Mr. Sharp in 1966, that cost-sharing agreements should be temporary in duration and replaced with unconditional financing once new programs are established. Otherwise, the continuation of joint programs would imply that the federal government is the primary repository of national values and that its judgement on priorities is superior to that of the provinces.

Problems Affecting Budgetary Planning

In addition to the general conceptual

problem of conditional grants, other budgetary and administrative difficulties have been encountered in shared-cost programs. All provincial expenditures should properly be part of a central budgetary plan which reflects the policies and priorities of provincial Cabinets. Yet, it has become evident that shared-cost programs tend to take on an autonomous life of their own, largely outside of provincial budget planning processes. Sustained largely by the program departments responsible for the original initiative and rigidly fixed by federal-provincial agreement for an unstated duration, each program develops its own "clientele" inside and outside government.⁷ This makes flexible and independent provincial programming difficult and, in essence, pre-empts large portions of provincial budgetary funds from annual review and adjustment. In 1972, for example, \$2.3 billion or 39 per cent of the Ontario budget was locked into shared-cost programs.

Provincial budgetary planning is also distorted by federal limitations on shared-cost financing such as arbitrary annual ceilings and rigidities in eligibility criteria, although service requirements and program technology change. This inflexibility, in turn, inhibits greater cost efficiencies. For the provinces, the major problem with mature shared-cost programs is to control escalating costs, modernize program delivery and alter spending priorities. It is at this stage — where federal and provincial attitudes diverge over the appropriate scope and mix of policies — that rigid and jointly-regulated schemes become a hindrance to optimal budget planning at both levels of government.

Two current examples can be drawn from the 1972 Staff Paper as illustrations of the problems posed by rigidities in shared-cost agreements in Ontario. A number of provincial commissions and study groups have suggested that nursing education in the province could be improved if the program were to be transferred from the Ministry of Health to the jurisdiction of the Ministry of Colleges and Universities. Although the Province now wishes to undertake such an internal administrative reform, this involves transferring federal cost sharing from the Hospital Insurance and Diagnostic Services Agreement to the Fiscal Arrangements Act, and a potential loss of federal reimbursements for the costs of nursing education. In short, the Province's ability to consider greater efficiency in its services is constrained and retarded by the inflexibility of

federal-provincial agreements.

The Province has also experienced considerable difficulty in securing federal sharing under the Canada Assistance Plan, such as for juvenile offenders' training program which is eligible for sharing in other provinces. There has been little disagreement about the "welfare" nature of this program, and hence its eligibility for sharing. But Ottawa insists that all CAP programs be administratively located according to federal stipulations — that is, in the Ministry of Community and Social Services; otherwise cost sharing will not be forthcoming. Some of the provinces have already combined departments or at least the services of different departments in order to secure better cost-sharing arrangements under CAP. Theoretically, Ontario could do the same and in the case of some current programs, it already has. However, the prime motive for administrative change should be the provision of better and more efficient services rather than qualification for CAP sharing. Even if the administrative difficulties involved were overcome, the effect of the organizational changes on the program content could be severe and undesirable. For example, in the case of the training schools referred to above, it is the opinion of officials involved that a change in administration, such as Ottawa has been suggesting, would lead not to greater integration of the various elements in the correctional process, but rather to increasing fragmentation. At any rate, the rigid administrative regulations attached to shared-cost agreements have prevented the Province from developing its own departmental organization to provide provincial services according to provincial priorities.

Administrative Problems

Specific administrative problems are evident in current shared-cost programs. Generally, they consist of delayed federal payments, auditing difficulties, differences about program aims and eligible costs, abrupt changes in program definition, and unsatisfactory procedures for program review or renewal. In 1971-72, the following programs contained one or more of these problems:

- Agricultural Manpower Agreement
- Agricultural Rural Development Agreement
- Second Language Agreement
- Citizenship and Language Agreement
- Health Resources Fund
- Medical Care Agreement
- National Health Grant

Fisheries Industrial Development
 Railway Grade Crossing Fund
 NHA Contribution for Urban Renewal
 NHA Loans for Land Acquisition and
 Development
 NHA Loans for Land Assembly

These differences are probably most serious when they involve delayed federal reimbursements. The Province commits \$2.3 billion in funds to all shared-cost programs together and can expect about \$1 billion in federal repayments. Any delay in federal payments is at the expense of the Province. While the Province has to submit claims by certain dates, there is no converse obligation upon the federal government to be punctual in its repayments or to make interest payments on late reimbursements. Three months after the 1971-72 fiscal year, for instance, the federal government still owed Ontario \$37 million for claims submitted.

Delays and difficulties are more critical to some programs than others. Joint programs this year range in size from \$1,740 for weather reporting to \$884,588,316 for hospital insurance. Over half of all these programs spend less than \$1 million each and together account for only 3 per cent of federal reimbursements to Ontario. In these, appears evident that the internal cost of collecting and submitting claims exceeds the amount of federal reimbursements. In the three largest programs, which account for 85 per cent of federal reimbursements, administrative costs are of more reasonable proportions, but repayment delays can be very costly. The magnitude of unpaid funds for 1971-72 alone can be seen in the following programs:

Adult Occupational Training	\$7.3 million
Medical Care Agreement	\$7.0 million
Subsidies for Public Housing	\$2.1 million
Hospital Insurance	\$2.0 million
Health Resources Fund	\$1.5 million
Sewage Works Projects	\$1.3 million

Intergovernmental liaison and consultation in a number of programs has been unsatisfactory. Indeed, the style of relationship that has developed frequently suggests that the federal government believes it alone should initiate change — an attitude which tends to negate the fact that these are joint programs in primarily provincial jurisdiction.

Often the Province has been faced with abrupt federal notices of ceilings to the sharing of program costs or termination of all or parts of a program. Few agreements have any formal provisions for consultation and most have no specific date or notice of termination. Such imprecision has led to numerous cases of unilateral and arbitrary federal action in a manner suggesting that program design and priorities are primarily matters of federal determination. New program initiatives are frequently announced without meaningful prior consultation with the Province. Also, the Ontario Government has had frequently to accept a definition of eligible costs established by federal auditors rather than through intergovernmental negotiation. In other instances, eligible costs and administrative processes have been defined by verbal agreement — an unsatisfactory situation because, if officials change, nothing remains enshrined in formal regulations.

IV—FUTURE TRENDS

From the present study and recent federal proposals⁸, the direction of shared-cost programs for the future seems clear. Generally in new and existing schemes, there is a federal push to terminate open-ended commitments where the level of federal financing is determined by provincial expenditure, and to attach greater interprovincial equalization to the terms of its cost sharing. Grants with such reduced relevance to actual provincial costs become less and less attractive to many provinces. At the same time, federal encouragement of

clientele support groups tends to build up expectations prior to negotiations and to circumscribe the freedom a province has in determining its own priorities.

Far from being a temporary involvement in areas of provincial jurisdiction by provincial consent, conditional grants are increasingly regarded by the central government as legitimate extensions of its authority and as alternatives to greater tax room and unconditional grants. Both conditional grants and unilateral expenditures, such as those of the Department of Regional Economic Expansion⁹, appear to be the federal alternative to the transfer of its surplus revenue capacity to the provinces.

The federal government supports its approach with two arguments. First, the central government maintains that it requires its existing tax capacity for economic stabilization purposes. Second, provincial governments should be publicly accountable by independently raising taxes to meet their expenditure responsibilities. Hence, Ottawa argues it cannot transfer greater tax room to the provinces, but is prepared, where necessary, to aid them through the mechanism of conditional grants. This implies continuing erosion of provincial fiscal integrity and a constant circumscribing of provincial constitutional autonomy, a result which is unacceptable within a modern concept of Canadian federalism.

An earlier Ontario paper discussed alternative methods of transferring federal tax revenues to the provinces.¹⁰ Whether or not tax sharing improves, there still will remain the complexities of joint programs which represent an impediment to proper budgetary management, at both levels of government, in terms of further improving the services involved and achieving greater cost efficiencies. For political, budgetary and administrative reasons, therefore, a reform of financing shared-cost programs is urgently required.

¹ Hon. W. Darcy McKeough, Ontario Budget 1971 (Toronto: Department of Treasury and Economics, 1971), pp. 5-9. Also, Hon. W. Darcy McKeough, Supplementary Papers on Federal-Provincial Finance, (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1972).

² Hon. W. Darcy McKeough, "The Reconstruction of Economic and Fiscal Policy in Canada," Statement to the Meeting of Ministers of Finance, Ottawa, November 1-2, 1971.

³ Staff Paper, "Federal-Provincial Shared-Cost Programs in Ontario," Ontario Tax Studies 8 (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, November 1972). This article is an excerpt from the introduction to this staff paper.

⁴ For greater detail of finance and negotiations during this period, see W. Eggleston and R. Craft, "Dominion-Provincial

Subsidies and Grants," Study of the Royal Commission on Dominion-Provincial Relations (Ottawa: King's Printer, 1939).

⁵ Canada, Royal Commission on Dominion-Provincial Relations (Ottawa: King's Printer, 1939).

⁶ J.M. Corry, "The Difficulties of Divided Jurisdictions," Appendix 7 of the Royal Commission on Dominion-Provincial Relations (Ottawa: King's Printer, 1939).

⁷ Clientele groups tend to have a vested interest in the maintenance and growth of a particular program as it sustains a certain administrative system or promotes a particular interest. Their support tends to shield a program from assessment in a broader budgetary context.

⁸ In making its proposals for the reform of the National Housing Act, for the extension of support for sport and recreation,

and for new cost sharing of health services, the federal government has made these plans without prior consultation of the provinces. In some instances, Ottawa has bypassed the province and made a policy commitment directly to the ultimate consumer of the shared-cost program. This is the case with NHA reforms; Ottawa has announced new grants to landlords and homeowners for the improvement of their property. However, these grants will only be made if the province agrees to share in half of the cost.

⁹ For a study of how DREE represents an abandonment by Ottawa of earlier policies aimed at helping provinces to help themselves in economic growth, see A. Careless, Canadian Federalism and Policies for Regional Development, (unpublished D. Phil. thesis, Oxford University, 1972).

¹⁰ Staff Paper, Intergovernmental Policy Co-ordination and Finance (Toronto: Department of Treasury and Economics, 1970).

Rates of Return and Taxation from Private Capital in Canada

Glenn P. Jenkins*

4

I—PURPOSE OF THE STUDY

Information on the rates of return and effective rates of taxation from capital in the private sectors of an economy are prerequisites for both rational public sector project evaluation and for the measurement of the degree of equity and distortion resulting from the economy's taxation system. Yet, in many countries, accurate knowledge of the values of these variables is absent. The principal objective of this study is to overcome this dearth of information for Canada.

II—DETERMINATION OF SOCIAL OPPORTUNITY COST

The evaluation of any public project which retards the growth of private investment must consider the social opportunity cost of this forgone investment as a cost to the project. In the formulation suggested by Harberger¹ for the evaluation of public capital expenditures, the social opportunity cost of the funds (expressed as a rate) is used to discount the net benefits of the project. The discount rate is defined as a weighted average of the rates of return from investment in the private sectors which have given up funds to finance the public project, plus a weighted average of the rates of time preference for consumption in the sectors that have forgone consumption to release resources for the public project. The weight that the rate of return or time preference in a sector receives is equal to the proportion of the total funds obtained from the particular sector.

In an alternative approach to project evaluation, Feldstein² and Marglin³ allow for the social opportunity cost of funds directly by deducting the consumption forgone in the transfer of funds from private to public use from the consumption benefits produced by the project. This formulation discounts the net consumption benefits produced by the project by the social rate of time preference.

In either of these two approaches, the gross rates of return from investment in the private sector of the economy must be known before the social opportunity cost of funds can be evaluated. As is shown by the results of this study, the non-neutrality of the taxation of income from capital between sectors is so significant that the use of any one rate of return from private investment will almost certainly lead to error.

For the analysis of the rates of return from capital, a distinction is drawn between the private rate of return received by the owners of the capital stock, the income generated by the capital which is collected by

governments through taxation, and the gross or social rate of return which is the total of the returns to the owner and the governments. A further breakdown of the tax payments to governments is carried out for the corporate income tax, the municipal property tax and sales taxes in order to evaluate the effective rates for each of these tax systems on the income from capital. In this paper the results of this analysis are reported annually for the period 1965 to 1969.⁴

III—TRANSFORMATION OF ACCOUNTING MEASURES INTO ECONOMIC VALUES

Any methodology designed to transform accounting data into economic values, as the case of estimating the economic rates of return from capital, will be somewhat specific to the way the accounting data exists for the country in question. However, the general principles involved will be applicable to all countries, although the details of procedure may differ. The most difficult problems may not stem from the particular form of the accounting data, but from the nature of particular sectors. Agriculture, residential housing and the resource industries are examples where the nature of the activity makes it extremely difficult to obtain reliable information, even when the best techniques available are used. Therefore, a systematic solution of the problem in the case of one country will provide useful guidelines that are generally applicable.

Sources

The primary sources of data used in this study are the taxation and financial statistics for corporations published by Statistics Canada.⁵ These data sets are disaggregated at the 2 and 3 digit level of standard industrial classification (S.I.C.). These sources give us a detailed breakdown of the corporations' balance sheets and profit and loss statements, but represent fiscal year-end values which do not necessarily correspond with calendar year-end values.

A third source of data utilized is the estimates of fixed capital flows and stocks for manufacturing and non-manufacturing industries, constructed by the Business Finance Division of Statistics Canada for 1926 to 1969. The values for the manufacturing variables and the methodology have been published,⁶ and permission was granted to use the unpublished data for the non-manufacturing industries in this study. These data are classified into the S.I.C. categories by establishment and include both corporate

and non-corporate organizations. Estimates for the gross and net capital stocks are arrived at by a perpetual inventory process using annual data for gross investment from 1870 to 1969: they are recorded in original cost, current replacement, and constant dollar prices. Within each industrial classification, separate estimates are made of the capital flows and stocks for building construction, engineering construction and machinery and equipment.⁷

Additional data sources have been used to estimate the current values of capital stock, revenues and expenses in the agricultural and residential housing sectors. This information will be discussed later when these sectors are analyzed.

IV—ESTIMATION OF RATES OF RETURN AND TAXATION OF CAPITAL

The rates of return and taxation of capital in manufacturing are estimated using a breakdown of twenty major industrial divisions with a further disaggregation of five of these into twelve sub-sectors. The non-manufacturing sector is initially divided into fourteen major industrial groups with a further breakdown of seven of these groups into twenty industries. In most cases the disaggregated industries do not constitute the complete major industrial division but are the most important sub-sectors for our purposes.

Starting with the balance sheets and profit and loss statements for the corporations, as presented in the taxation and financial statistics, we find that the rules of accounting and taxation create discrepancies between the accounting data and the economic values they would ideally measure. In this study there are seven basic adjustments which we are able to apply to accounting information to give it economic significance. These adjustments are summarized below, followed by the methodology used to implement them.

- 1) The values of fixed assets are usually recorded in the accounts of corporations in original cost prices; therefore, inflation will lead to an increase in the nominal income of the firm, while no adjustment would be made to the nominal value of the capital stock. To correct this, we have to adjust the value of the capital stock from original cost dollars to current replacement dollars so that both the nominal value of income and the capital stock reflect the existence of inflation.

*The author is Assistant Professor of Economics, Harvard University and consultant to the Economic Planning Branch, Ministry of Treasury, Economics and Intergovernmental Affairs. Dr. Jenkins is especially indebted to Arnold C. Harberger, Larry A. Sjaastad, Robert J. Gordon, and to Miss. Terry Chaput and Mr. Joseph Martaus for their research assistance.

Taxation laws have necessitated the use of arbitrary rules for the evaluation of depreciation expenses allowed for tax purposes each year. This value usually will not accurately measure the true economic depreciation of fixed assets. Therefore, the valuation of the fixed capital stock must be made so as to reflect the true economic depreciation that has occurred.

- 2) In the calculation of rates of return from capital in various economic activities, it is the return from fixed assets and working capital required for the operation of the industry which we are interested in (not the financial assets of non-financial industries which are held solely for their yield). Operational assets are estimated by subtracting the financial assets from the total value of assets in the industry.⁸
- 3) Depreciation expenses allowed for income tax purposes diverge from the true economic depreciation if either the rates allowed are incorrect or changes occur in the cost of replacing the asset. The taxation depreciation expense is based on the original cost of the asset. If the cost of replacing an asset increases, the gap between the true value of the economic depreciation of the asset and the taxation depreciation allowed also increases. In order to measure the economic return from the capital stock of an industry, its profits must be corrected to reflect the economic depreciation expense (not the depreciation expense calculated for taxation purposes).
- 4) Debt charges, taxes, and charitable donations paid by the industry, even though they represent expenses from the equity-holders' point of view, are part of the value of the product produced by the capital of the industry; therefore, they should not be deducted as an expense when calculating the income generated by the capital stock of the industry.
- 5) The financial data in the corporate profit and loss statements include income from financial assets as part of the firm's income. However, as these assets are not included as part of the capital stock of the industry, we must not

include the revenue generated by these assets as part of the income of the industry's capital stock.

- 6) In the Canadian economy, a significant part of government revenue is collected through excise taxes. Provided that material inputs enter into their respective products in fixed proportion to output, we can translate the excise tax on output as a tax on the gross value added of labour and capital. When different rates of excise tax are present in an economy, or if the depreciation rates of the capital stock are not all the same, the relative social rates of return from capital are altered by the existence of excise taxes.⁹
- 7) A final adjustment to the revenues of the industries is necessitated because of changes in the relative prices of their capital stocks. These changes in the relative price represent accrued capital gains or losses to the industries which are not recorded as income in the financial statistics.

A capital gain or loss which is unanticipated and not expected to be repeated has a different behavioural effect on the industry than if the capital gain or loss is expected. For most purposes of analysis, these capital gains or losses should be included in the rates of return only when they become expected. In this study the rates of return are estimated (with a few exceptions) both including and excluding the accrued capital gains and losses; however, in the applications of the rates of return, the accrued gains or losses are not included.

Value of Net Stock of Buildings and Equipment

In deriving net current replacement values of the capital stock (Adjustment 1), we encounter difficulty, since corporate financial and taxation data are not based on a comparable sample of firms each year. Therefore, because of mergers and divisions of corporations, it is not possible to calculate values for gross investment by comparing the gross buildings and equipment and depreciation expenses for sequential years. It is now that total industry estimates for the stocks of buildings and equipment are utilized.¹⁰

We also assume that the historical timing of gross investment in the corporate and to-

tal industry sector has been approximately the same, differing only in scale, and that the economic lives of assets are the same in the corporate and non-corporate sectors of an industry. It follows that the same relationship exists between the net stock of buildings and equipment in current replacement dollars (K_{ct}^n) to the gross stock of buildings and equipment in original cost dollars (K_{ot}^g) in both the corporate (α) and total industrial (τ) sectors for each time period (t). The value of the gross stock of buildings and equipment for the corporate sector is given in the taxation and financial statistics for each industry, and is expressed in original cost dollars, αK_{ot}^g . Using this information, along with the capital stock estimates for the total industrial sectors, we are able to calculate the values of the net stock of buildings and equipment in current replacement prices for each industry, each year, as follows:

$$1) \quad \alpha K_{ct}^{ni} = \left(\frac{\tau K_{ct}^{ni}}{\tau K_{ot}^{gi}} \right) \left(\alpha K_{ot}^{gi} \right)$$

where:

αK_{ct}^{ni} = Net stock of buildings and equipment, corporate sector in current replacement cost dollars in the i th industry in time period t .

τK_{ct}^{ni} = Net stock of buildings and equipment, for total sector in current replacement dollars in the i th industry in time period t .

τK_{ot}^{gi} = Gross stock of buildings and equipment of total industrial sector in original cost dollars for the i th industry in time period t .

αK_{ot}^{gi} = Gross stock of buildings and equipment for the corporate sector in original cost dollars for the i th industry in time period t .

This procedure corrects the book value of the buildings and equipment in the corporate sector for changes in the nominal value of the assets due to inflation or shifts in relative prices, as well as adjusts the gross value for the economic depreciation that has taken place. In the case of land where no depreciation takes place, the book values have to be corrected only for the changes in its price.

Value of Working Capital

To make Adjustment 2, the financial assets

(not held as working capital) are excluded from the value of the capital stock, as is the yield from these assets from the revenue of the industry. In this study the assets that constitute the working capital of an industry include cash, accounts receivable less accounts payable, inventories and prepaid expenses. Except for inventories, these items are recorded in the corporate accounts in current dollars. In the case of inventories, the widespread use in Canada of the procedure of recording the value of inventories on a first-in, first-out basis combined only with a moderate rate of inflation, implies that their value in the corporate accounts is very close to their true current value. Therefore, no adjustment of the value of inventories has been made.

Capital Stock of Industry

When the value of the working capital in an industry has been determined, the current value of the total capital stock in each industry is obtained by adding to the working capital the current value of the fixed assets. Included in the stock of fixed assets are the current value of land, the net current replacement value of buildings and equipment and net depletable assets. There are some kinds of investment expenditure which are generally written off in the current period, even though they may have a value beyond the period of investment. Examples of these are: exploration expenditures in the resource industries; research and development expenditures; advertising costs; and the costs borne by an industry for the specific training of its labour force.

When historical data for exploration expenditures are available, the stock of exploration capital can be evaluated and included in the net depletable assets of the resource industry. If the income from capital is also adjusted for the depletion expenses, the bias in the rate of return caused by this depletable item is eliminated. The carry-over of advertising benefits is more difficult to estimate because of the different forms such expenditures can take. When such a carry-over exists, a bias may result in the estimate of the rates of return when it is not included in the value of capital stock for the industry.¹¹

Excluding the value of investment in human resources in the industry from its stock of capital may also cause a discrepancy between the measured and true rate of return from capital. The sign of this bias will depend on the rate at which investment in human resources in the industry is increasing.¹²

Economic Depreciation Allowance

Since depreciation expenses allowed for tax purposes diverge from the value of economic depreciation, we must make a correction (Adjustment 3) in the calculation of profits. To find the value of the economic depreciation for the corporate part of an industry, we again use the information in the estimates of the fixed capital flows and stocks prepared by Statistics Canada.¹³ From this data we can obtain values for the economic capital consumption allowance in current dollars for the total industry (τD_{ct}^e). Using these values, we can calculate the economic capital consumption allowance for the corporate part of an industry in current dollars (αD_{ct}^e) as follows:

$$2) \quad \alpha D_{ct}^{ei} = \left(\tau D_{ct}^{ei} \right) \left(\frac{\alpha K_{ct}^{ni}}{\tau K_{ct}^{ni}} \right)$$

where:

αD_{ct}^{ei} = Economic capital consumption allowance in current dollars for corporate part of industry i in year t .

τD_{ct}^{ei} = Economic capital consumption allowance in current dollars for total industry i in year t .

αK_{ct}^{ni} = Net capital stock for corporate sector in current dollars in industry i for year t .

τK_{ct}^{ni} = Net capital stock for total industry in current dollars in industry i for year t .

The adjustment to current profits due to the correction of the depreciation expense is derived as follows:

$$\text{Adjustment to profits due to correction of depreciation expenses} = \left[\begin{array}{l} \text{Depreciation expense allowable for taxation purposes} \\ \text{Economic capital consumption allowance in current dollars for the corporate sector.} \end{array} \right]$$

Value Added of Capital Stock

To determine the total income from capital (Adjustment 4), we start with the book value of profits adjusted to reflect the value of the economic depreciation expense. To this figure the income taxes paid, property taxes, mining and logging taxes, charitable donations, mortgage interest paid, bond interest

paid and other interest paid are added. Also included as part of income are the realized gains from the sale of fixed assets. Since profits still include the income from financial assets, this total will be larger than the final income we attribute to the capital stock of the industry. However, this income figure does not include the value of sales taxes produced by the value added of capital.

For the calculation of the income from capital, we must subtract the income from financial assets, which are held primarily for their yield (Adjustment 5). Financial income is defined as the sum of mortgage interest received, bond interest received, other interest received, realized capital gains on financial assets, and Canadian and foreign dividends received.

In Canada, sales and excise taxes are levied by both the federal and provincial governments. The primary sales tax of the federal government is the wholesale tax which is paid on a wide range of manufactured goods. Provincial governments traditionally have levied sales taxes at the retail level. From the Input-Output Division of Statistics Canada, we were able to obtain the value of sales for 197 industries for 1961 and the value of the federal sales tax paid on the sales of 644 commodities produced by these industries.¹⁴ Using the Statistics Canada industry commodity matrix, we were able to derive the dollar value of sales tax paid on the domestic output of the industry. Since we know the value of output for the corporate part of each industry for the years 1961 to 1969, we can estimate the amount of sales tax paid on corporate output by multiplying the total sales tax by the ratio of corporate output to total output in the industry.

For years other than 1961, the ratio of sales tax to commodity output is adjusted as the tax base and rates are changed. However, there have been few changes in the base and rates of this tax. From 1959 to 1967 the general federal sales tax rate was 11 percent; in 1967 it was raised to its present level of 12 percent.

The *Canadian National Accounts* show the value of provincial sales tax paid by commodity and the estimated values of sales of commodities for the years 1947 to 1972.¹⁵ In order to find the value of provincial sales tax paid on the corporate output, the commodity groups are aggregated into industry divisions and the effective rates of sales taxes on total sales are estimated. By applying these rates to the domestically produced output of the corporate sector, we can evalu-

ate the total value of sales taxes paid by industry. The federal and provincial sales taxes paid on corporate output are added together for each industry by year. These sales taxes represent a tax on both the gross value added of labour and the gross value added of capital. On the assumption that material inputs enter production in fixed proportion to output, the sales tax on output can now be translated into a tax on the gross value added of labour and capital. The value of sales tax produced by the value added of capital is determined as follows:

$$3) \quad S_K = \left(\frac{V_K^n + \alpha D_c^e}{V_L + V_K^n + \alpha D_c^e} \right) S_T$$

where:

S_K = The value of sales tax attributed to capital in corporate part of industry.

S_T = Total value of sales tax paid on output of corporate part of industry.

V_K^n = Net value added of capital.

αD_c^e = Economic depreciation expense of corporate part of industry in current prices.

V_L = Total value added of labour.

Accrued Capital Gains and Losses

A measure of accrued capital gains and losses arising from changes in the value of the fixed capital stock can be made by comparing movements in the price index for the fixed capital stock of the industry with those of the gross national product deflator, as follows:

$$4) \quad G_t^i = (\dot{p}_{Kt}^i - \dot{p}_{Qt}^i) (\alpha K_{ct-1}^{ni})$$

where:

G_t^i = The value of the capital gains or losses in the i th industry during year t .

\dot{p}_{Kt}^i = The rate of change of the price index for the capital stock of industry i in year t .

\dot{p}_{Qt} = The rate of change of the gross national product implicit price index in year t .

αK_{ct-1}^{ni} = The net stock of fixed capital in the corporate sector of industry i in year $t-1$ in current replacement prices of year $t-1$.

If all price indices do not move at the same rate during the business cycle, there may be transitory gains or losses which are eliminated in another phase of the cycle, making it difficult to differentiate changes in relative prices from the adjustment of prices due to inflation. Taxes will also cause relative prices to change. The predominance of capital gains from 1963 to 1965 can be attributed to changes in federal sales tax on production machinery. In January 1963, the tax was set at 4 per cent; it rose to 8 per cent in April 1964 and to 11 per cent in January 1965. Similarly, capital losses were experienced from 1967 to 1969 with the lowering of the tax to 6 per cent in April 1967, and to zero in 1968.

Characteristics associated with certain sectors such as mining, mineral fuels, agriculture and residential housing, necessitate some modification of the above methodology in order to meet the requirements of the seven adjustments stated previously. A brief description of these modifications follows.¹⁶

Mining and Mineral Fuel Industries

The mining and mineral fuel industries are unique because a significant portion of the value of their capital stocks is created by exploration and development expenditures which may be written off for tax purposes during the period in which the exploration is conducted. Therefore, the taxation statistics will record a very small value for the stock of depletable assets which should equal the capitalized value of the exploration and development expenditures. Accordingly, the historical exploration and development expenditures were accumulated and depreciated to obtain the current value of depletable assets. We also found that after we adjusted the value of net depletable assets, as recorded in the financial statements of the corporations, these two estimates of net depletable assets at current prices were quite close. The latter estimates for the depletable assets of mining and mineral fuels were used.

The mineral fuels industry is mainly located in Alberta and is almost entirely concerned with the development and extraction of natural gas and crude oil. The Alberta Government has obtained revenue from the oil companies through a system of production royalties and mineral right sales. These

provincial revenues are generally deducted from taxable income for federal income tax purposes and, therefore, involve a transfer of income tax revenue from the federal government to the provincial government.

Difficulty arises when we try to divide these provincial revenues between payments made by the mineral fuels and petroleum refining industries as most companies engage in both activities. Also, the data for the revenues from the royalties and mineral rights are not classified by industry. Therefore, after analyzing each industry separately before including the provincial revenues, we aggregate the capital stock and income data for refineries and mineral fuels and construct the private and social rates of return for the combined sector.

Agriculture

The contribution of agriculture to the national economy declined in relative size during the period 1953-1970, even though government continued to provide extensive assistance. At present, agriculture is completely dominated by the non-corporate form of organization, with only two per cent of assets owned by corporations. In this study we treat the entire agricultural sector as being non-corporate.

Most of the information required for estimating the rates of return in agriculture have been collected in their current values by various statistical agencies in Canada. Current revenue, including income-in-kind and operating expenses, is available annually for the period 1953 to 1970. Income-in-kind includes the food, construction materials and imputed house rental that agriculture provides for farmers.¹⁷ The values of the capital stock, which includes land, buildings, livestock, poultry, implements and machinery, are estimated by a semi-annual survey and are supplemented by the Census of Agriculture which is conducted every five years. All the capital stock data which are published are evaluated at current net replacement cost.¹⁸

Two serious deficiencies in the available information have to be corrected before the rates of return can be estimated. Estimates do not exist for either the total amount of direct subsidies to agriculture or the social opportunity cost of non-wage labour employed in agriculture. The latter creates a problem because, after all operating and paid-labour costs are deducted from the value of gross sales, the residual net income is partially produced by the capital of the owners, along with the labour of the owners

and non-wage family workers.

To overcome this difficulty, upper and lower limits are estimated for the imputed income of non-wage labour in agriculture. As the number of man years of paid labour per year and total annual wages are known, the annual income per paid labourer can be determined. To obtain the upper limit on the size of the imputed income to the non-wage labourers, it is assumed that they earn an annual income equivalent to that of the paid workers. As unpaid family workers (including part-time help from family members) constitute approximately 30 per cent of the total non-wage labour force, this estimate represents an over-estimate of the value of non-wage labour in agriculture. The low estimate for the value of non-wage labour in agriculture is constructed by imputing the paid workers' wages to the employers and owners of farms but a zero wage to the unpaid family workers. As the supply price of unpaid family labour is almost certainly greater than zero, this estimate of the value of non-wage labour should represent a lower limit for the value of this variable.

Support programs for agriculture have a long history of popularity in Canada. In all, there are currently nine different Acts of Parliament providing assistance to agriculture. Each of these is examined for the years 1965 to 1969 to determine the form of subsidy and to evaluate its direct financial benefit to the sector for each year.¹⁹ From the total subsidy paid to agriculture each year, we can estimate both the private and social rates of return from capital for the years 1965 to 1969.

Residential Housing

To evaluate the private and social rates of return from owner-occupied and rental housing, we use the estimates of gross imputed and gross paid rents made by the National Accounts Division of Statistics Canada. We are able to obtain from this source an unpublished breakdown of the housing expenses (property taxes, repairs and maintenance, insurance) with which we can calculate the net income accruing to the stock of residential housing. The current values of the stock of non-farm houses, along with their annual depreciation expense, are obtained from estimates made by Statistics Canada.²⁰

It is necessary to obtain a separate series on the current value of the stock of owner-occupied and rental housing because of differential tax treatment. The current value of the total non-farm housing stock is multiplied by the ratio of gross imputed rents from

owner-occupied housing to the total rents (imputed plus paid) from residential housing. This provides us with an estimate of the current value of the owner-occupied housing stock.

Personal income tax in Canada does not cover the income accruing from the equity portion of owner-occupied dwellings. Because this income is exempt, there is an implicit subsidy given to the purchase of housing services through the ownership of a dwelling. This subsidy is equal to the owner's marginal personal income tax rate times the amount of equity he has in his house, times the rate of return. In this study we make the assumption that the 'typical' taxpayer is in the 25 per cent marginal tax bracket, and that the owner's equity is equal to 50 per cent of the value of the non-rental housing stock. With these assumptions we obtain the rate of the subsidy as a percentage of the value of the owner-occupied housing stock.

Because of the way the total stock of non-farm housing is divided into rental and owner-occupied stocks, we are assuming that the private rates of return in the two categories are equal. In fact, the gross or social rate of return from the rental housing stock is larger than the gross return from the owner-occupied stock by the amount of the implicit subsidy created by exempting the services of owner-occupied housing from taxable income.

The final point in the methodology is concerned with the extension of the analysis to the non-corporate part of industry sectors. After taking care of agriculture and residential housing, we find that very few other sectors are made up of a significant proportion of non-corporate firms, except those in the trade and service sectors.

Non-Corporate Industrial Sector

Although no revenue or tax data exist for the non-corporate industrial sectors, the size of their capital stocks and their rates of return can be estimated from the corporate financial data and the existing estimates of the total capital stock for each industrial sector. The proportion of an industrial sector that is non-corporate can be determined by comparing the values of the gross capital stock at original cost dollars for the total industrial sector, as estimated by Statistics Canada, with this same variable for the corporate part of the sector as found in the financial statistics for the corporations. The value of the net capital stock of the total sector is then adjusted to include the working capital in the

sector, based on the assumption that the ratio of working capital to total fixed assets is the same in the corporate and non-corporate segments of an industry.

After estimating the size of the non-corporate capital stock, we are left with the problem of determining the correct rates of return to attribute to this part of the capital stock of each industry. Christensen, in his analysis of the rates of return from capital for the United States, found that the private rate of return in the non-corporate part of an industry has been approximately equal to the private rate of return in the corporate part.²¹ Therefore, the social rate of return from the non-corporate part of an industry would equal the social rate of return in the corporate sector minus the rate of corporate income tax paid on all assets. The private rate of return in the non-corporate sector is then easily determined by deducting the remaining taxes paid from the non-corporate social rate of return.

V—ESTIMATES OF RATES OF RETURN AND TAXATION

By applying the methodology developed in the above section, we make adjustments to the accounting data. The resulting information which is used to estimate the rates of return and taxation, is presented in Tables A through F of the appendix. Table A contains the values for the working capital and fixed assets of the sectors for the years 1965 to 1969. The values for the capital stocks are in net current replacement cost prices which reflect the transformations made to the data by adjustments 1 and 2.

The incomes generated by the capital stocks which accrue to the private sector are presented in Table B. These values reflect adjustments 3, 4, and 5, except that they exclude taxes paid. Private income from the stock of capital includes both the interest paid on debt and any subsidies received by the industry.

Accrued capital gains and losses by sector are estimated following the procedure of Equation 4 (Adjustment 7) and are shown in Table C. These values are also expressed in current prices for the year in which they accrue. Tables D to F, respectively, contain the values of property taxes, income taxes and sales taxes, paid by the income from capital.

From this information the private and gross or social income, as well as the various taxes, can be expressed as percentages of the stock of capital in a sector to derive rates of return and taxation. Some of the more im-

portant of these rates are presented in Table 1. The private rates of return, excluding and including capital gains and losses, are shown in columns 1 and 2 respectively. Excluding capital gains and losses, we find the private rates of return in the manufacturing sector averaged 6.5 per cent over the five year period 1965 to 1969. This is to be compared with a private rate of return in the non-manufacturing sector of 6.3 per cent and the weighted average of all activities of 5.8 per cent. The rather small range of values for the private rates of return contrasts with the values of the social rates of return that include all taxes (column 7), where the rate of manufacturing is 15.1 per cent for non-manufacturing 9.4 per cent and the average of all activities 9.4 per cent.

For an estimation of the social opportunity cost of public funds or the social cost of private investment, it is the value of the taxes and subsidies (columns 3 to 5) and the resulting social rates of return (column 7) that are of primary interest.

For most governments, the capital market is the marginal source of revenue for financing investment projects, while in periods of budgetary surplus, funds are made available to the capital market either by slowing

down the rate of government borrowing or by diminishing the public debt. In this context it is appropriate to evaluate the social opportunity cost of public funds as the social value of these resources, if they were used in the private sectors of the economy. When governments borrow, they bid financing away from the private sectors in different proportions depending on the demand elasticities with respect to the cost of borrowing in the individual investment and consumption sectors.

Following the method proposed by Harberger²² for evaluating the social opportunity cost of a given amount of government borrowing, we weight the social return from investment and the social rate of time preference for consumption in each of the non-government sectors by the proportion of the funds that was bid away from that sector. For funds bid away from investment in the private sectors, the appropriate social returns to be weighted are those presented in column 7 of Table 1. For Canada the supply of resources can also be increased by foreign borrowing; the social cost of these funds is measured as the real rate of interest paid on securities sold abroad.

An accurate measure of the weights for

each of the rates of return or time preferences in the private sectors would require information on the reaction of each of the private sectors to an increase in government borrowing. Using a somewhat less precise weighting scheme, the author in a previous study²³ estimated the social opportunity cost of government borrowing to be approximately 9.5 per cent for Canada during the period 1965 to 1969. The weighting scheme used to give this estimate implied that of any increase in government borrowing 10 per cent was financed by capital inflows from foreign countries, 16 per cent was financed by a reduction of residential housing construction, 10 per cent came at the cost of domestic consumption, and the remaining 64 per cent was financed by a reduction of investment in the industrial sectors.

This has been one example of the many applications that can be conducted with the information provided by this study. As previously mentioned, any evaluation of the equity and efficiency of the taxation of the income from capital in Canada will require this information as will any method of project evaluation which takes into consideration the social opportunity cost of funds.

¹A.C. Harberger, "On Measuring the Social Opportunity Cost of Public Funds", The Discount Rate in Public Investment Evaluation: Conference Proceedings of the Committee on the Economics of Water Resources Development (Denver: Western Agricultural Economics Research Council, 1968).

²M.S. Feldstein, "Net Social Benefit Calculation and the Public Investment Decision", Oxford Economic Papers, XVI (March, 1964). Also, M.S. Feldstein, "Choice of Technique in the Public Sector: A Simplification", Economic Journal, XX (December, 1970).

³S.A. Marglin, "The Opportunity Costs of Public Investment", Quarterly Journal of Economics, LXXVII (May, 1963).

⁴Although the values for many of the variables can be derived for a much longer period of time, it is only from 1965 to 1969 that complete information is available. The results, complete and incomplete, for the period 1953 to 1969 are presented in Glenn P. Jenkins's Analysis of Rates of Return from Capital in Canada (unpublished Ph.D. dissertation, University of Chicago, 1972). Dr. Jenkins's Ph.D. dissertation was partially supported by the Canada Council.

⁵Statistics Canada, Corporation and Labour Unions Return Division, Corporation Financial Statistics, 1965-1969, Catalogue No. 61-207 and Corporation Taxation Statistics, 1965-1969, Catalogue No. 61-208.

⁶Statistics Canada, Business Finance Division, Fixed Capital Flows and Stocks, Manufacturing Canada 1926-1969, Catalogue 13-523.

⁷In general, price indices have been constructed for the different categories of assets for each industry and estimates made of their length of economic life. Also price indices for industrial, agricultural and residential land were constructed. For a more complete discussion of the methodology used to con-

struct price indices and length of life estimates see: Jenkins, pp. 6-16; T.K. Rymes, Fixed Capital Flow and Stocks Methodology (Statistics Canada, 1967); C.M. Jones, "Price Indexes for Non-Residential and Engineering Construction", Canadian Statistical Review, XLV, No. 1 (Statistics Canada, Jan. 1970); P.S.K. Murty, "Revised Price Indexes of Construction Expenditures for G.N.E. Deflation", Canadian Statistical Review, XLV, No. 11 (Statistics Canada, Nov. 1970).

⁸In the case of financial intermediaries where the portfolio of financial assets is necessary to carry out their economic function, this adjustment does not apply. In this study the rates of return for this industry are estimated using two different assumptions about the composition of the capital stock: (a) capital defined inclusive of financial assets and (b) capital defined as the economic value of the equity.

⁹Arnold C. Harberger, "The Measurement of Waste", American Economic Review, LIV (May, 1964), 58-76.

¹⁰Buildings and equipment in the capital stock estimates prepared by Statistics Canada, Business Finance Division, refer to building construction, engineering construction and machinery.

¹¹The direction of bias was evaluated theoretically and some empirical testing was conducted by T.R. Stauffer in Measurement of Corporate Rates of Return (unpublished Ph.D. dissertation, Harvard University, 1971).

¹²When the investment in specific training is not capitalized, the measured capital stock of the industry is smaller than its true economic value. This tends to bias the measured rate of return upward. However, the net income of the firm also decreases as the investment in this training each year is treated as a

current expense and not depreciated through time. For the calculation of rate of return, these two errors in measurement tend to offset each other.

¹³For a more complete description of the derivation of the economic life assumptions see Rymes, pp. 87-103.

¹⁴The Input-Output Division of Statistics Canada has constructed the federal sales tax margins by commodity from 1961 to 1967. However, except for 1961, they have been reluctant to release this information.

¹⁵These data were released to us by the National Accounts Division, Statistics Canada for use in this study. This information is not published.

¹⁶For the more complete explanation of the methodology as related to mining, mineral fuels, agriculture and residential housing, see Jenkins, pp. 47-67, also appendices, A, C and D.

¹⁷Statistics Canada, Farm Finance Section, Farm Net Income, Catalogue No. 21-202.

¹⁸Statistics Canada, Agriculture Division, Quarterly Bulletin of Agricultural Statistics, Catalogue No. 21-003.

¹⁹For the agriculture labour force data, estimation of non-wage labour income, and the estimation of the value of subsidies given to agriculture, see Jenkins, Appendix D.

²⁰Statistics Canada, Housing and Building Permits Section, Canadian Housing Capital Stock (unpublished).

²¹L. R. Christensen, "Entrepreneurial Income: How Does It Measure Up", American Economic Review, LXI, No. 4 (September, 1971).

²²A. C. Harberger, "On Measuring the Social Opportunity Cost of Public Funds".

²³Jenkins, p. 99.

TABLE 1
RATES OF RETURN AND TAXATION FROM CAPITAL IN CANADA BY SECTOR
 Average 1965-1969

Industry		1 d Private Rate of Return Excluding Capital Gains and Losses	2 e Private Rate of Return Including Capital Gains and Losses	3 f Property tax as a percentage of Net Fixed Assets and Working Capital	4 g Income tax as a percentage of Net Fixed Assets and Working Capital	5 h Sales taxes as a percentage of Net Fixed Assets and Working Capital	6 i Gross Rate of Return Excluding Capital Gains and Losses and Sales Taxes	7 j Social P of Re Exclud Capital Gains and Losses In- cluding Sales Tax
1.	Foods and Beverages	7.99	7.21	.79	5.10	15.78	13.88	29.66
	A. Food Industries	6.67	5.87	.77	3.49	.41	10.94	11.34
	B. Soft Drinks	10.82	9.91	.91	5.82	5.66	17.25	23.30
	C. Breweries and Wineries	11.57	10.88	.68	10.28	74.16	22.52	96.68
2.	Tobacco Products	6.96	6.66	.37	6.41	119.27	13.73	133.00
3.	Rubber Products	5.15	4.48	.41	3.31	2.54	8.86	11.41
4.	Leather Products	5.19	4.91	1.06	2.69	3.54	8.94	12.48
5.	Textile Mills	4.81	3.65	.51	2.31	1.40	7.62	9.01
6.	Knitting Mills	6.21	4.67	.84	3.09	5.62	10.14	15.76
7.	Clothing Industry	6.57	6.05	.88	2.99	4.47	18.44	14.92
8.	Wood Industry	6.98	5.79	.51	2.90	.14	10.39	10.53
9.	Furniture	6.62	5.95	1.26	2.75	4.61	10.63	15.23
10.	Pulp and Paper and Allied Ind.	4.65	3.63	.56	2.22	.21	7.44	7.65
	A. Pulp and Paper Mills	4.56	3.17	.52	1.98	.11	7.07	7.17
	B. Paper Boxes and Convertors	6.73	5.69	1.07	5.26	1.29	13.06	14.34
11.	Printing and Publishing	9.49	8.76	.73	5.42	1.02	15.64	16.66
	A. Commercial Printing	8.28	7.57	.78	3.39	1.86	12.45	14.31
	B. Publishing	2.36	1.32	.11	1.54	.21	4.00	4.21
12.	Primary Metals	6.02	4.92	.23	2.29	.27	8.53	8.79
13.	Metal Fabricating	6.51	6.10	.67	3.77	.66	10.96	11.62
14.	Machinery Industries	9.10	8.77	.45	4.61	1.58	14.17	15.75
15.	Transportation Equip.	7.73	7.25	.59	5.39	9.34	13.71	23.04
	A. Aircraft and Parts	4.22	3.89	.40	.66	.92	5.29	6.20
	B. Motor Vehicles	11.45	10.59	.70	8.38	15.54	20.54	37.08
	C. Miscellaneous Transportation	4.05	3.63	.65	3.80	1.14	8.50	9.65
16.	Electrical Industries	6.37	5.82	.46	3.07	4.30	9.90	14.20
	A. Electrical Industrial Equip.	5.54	4.98	.73	2.77	1.27	9.04	10.32
	B. Other Electrical Products	7.03	6.43	.31	3.93	6.13	10.68	16.81
17.	Non-Metallic Mineral Products	6.09	5.05	.46	2.39	.50	8.95	9.44
18.	Petroleum and Coal Refineries	5.84	4.91	1.33	1.35	4.71	8.51	13.22
19.	Chemical Industries	6.33	5.39	.45	4.26	.91	11.03	11.94
20.	Miscellaneous Manufacturing	6.47	5.93	.72	5.10	3.32	12.29	15.61
21.	Total Manufacturing	6.45	5.53	.61	3.32	4.77	10.38	15.14
22.	Total Construction	6.54	6.24	.68	2.61		9.82	9.82
	A. Building Contractors	4.92	4.79	.81	2.12		7.84	7.84
	B. Bridge and Highway Construction	6.33	5.98	.41	2.76		9.50	9.50
23.	Total Transportation	2.62	.59	.82	1.06		4.50	4.50
	A. Air Transport	3.49	1.81	.36	.35		4.20	4.20
	B. Water Transport	1.78	-.28	.27	.58		2.64	2.64
	C. Railways	1.03	-1.00	.67	.90		2.60	2.60
	D. Truck Transport	9.08	7.67	3.24	2.71		15.03	15.03
	E. Pipelines	6.56	4.28	.64	1.92		9.12	9.12
24.	Storage	4.00	4.14	1.33	1.18		6.50	6.50
	A. Grain Elevators	3.27	3.41	.62	1.01		4.89	4.89
	B. Storage and Warehouse	6.05	5.96	3.61	1.96		11.62	11.62
25.	Communications	6.94	5.26	.84	2.63	.48	10.40	10.88
	A. Radio and Television	5.71	4.56	.50	3.95		10.16	10.16
	B. Telephones	7.00	5.29	.97	2.53	.53	10.41	10.94
26.	Public Utilities	5.57	1.41	.91	1.78	.61	8.27	8.87
	A. Electrical Power	4.97	.69	.81	2.00	.66	7.78	8.44
	B. Gas Distribution	6.32	2.21	1.00	1.57	.58	8.89	9.47
27.	Wholesale Trade	7.72	7.57	.75	3.61	.54	12.09	12.63
28.	Retail Trade	7.59	7.33	1.62	3.53	.57	12.73	13.30
29.	Total Finance, Insurance, and Real Estate	4.22	4.21	.23	.39		4.84	4.84
	A. Trust Companies	4.81	4.81	.04	.34		5.19	5.19
	B. Mortgage and Loan Companies	5.16	5.17	.01	.20		5.27	5.27
	C. Banking	3.30	3.29	.02	.41		3.73	3.73
	D. Total Deposit Accepting Institutions	3.27	3.28	.02	.36		3.65	3.65
	E. Total Investment Companies	4.89	5.26	.04	.25		5.17	5.17
a* 29.	Total Finance, Insurance, and Real Estate	6.74	6.73	.90	1.52		9.16	9.16
	*A. Trust Companies	6.64	6.67	.48	4.05		11.16	11.16
	*B. Mortgage and Loan Companies	10.07	10.17	.17	2.17		12.41	12.41
	*C. Banking	8.57	8.31	.38	9.02		17.96	17.96
	*D. Total Deposit Accepting Institutions	7.51	7.55	.29	6.20		14.00	14.00
	*E. Total Investment Companies	6.10	6.10	.06	.33		6.48	6.48
30.	Total Services	9.88	9.83	1.46	2.24	.17	13.58	13.75
	A. Services to Business and Management	17.42	17.07	1.05	7.34		25.82	25.82
	B. Personal, etc., Services	9.43	9.53	1.46	1.65	.19	12.54	12.73
b 31.	Total Non-Manufacturing	6.25	5.31	.95	2.01	.13	9.21	9.39
32.	Mining	7.36	n.a.	.38	2.42		10.16	10.16
33.	Mineral fuels	4.94	n.a.	.42	.80		6.18	6.18
	A. Mineral fuels and Petroleum Refineries	5.34	n.a.	5.05	1.06	2.27	11.45	13.71
34.	Agriculture	2.66	5.20	.80	-.63		2.83	2.83
** 34.	Agriculture	4.31	6.85	.80	-.63		4.48	4.48
35.	Rental Housing	5.33	7.84	2.48	nil		7.86	7.86
36.	Owner Occupied Housing	5.38	7.84	2.48	-.67		7.19	7.19
37.	Trade (non-corporate)	7.34	7.19	1.13	nil	.56	8.47	9.03
c 38.	Total All Activities	5.82	n.a.	1.49	1.13	1.00	8.44	9.44

a. The rates of return and taxation in categories *29 and *29A through *29B for financial intermediaries are based on the value of equity in the sector and the private rates of return only include income accruing to the equity holders.

b. The rates for non-manufacturing exclude 29 but include *29 for financial intermediaries.

c. The rates of return for the total of all activities excludes categories 29 and 34 but includes *29 and **34.

d. (Table B ÷ Table A) x 100 and averaged over the five years 1965-1969.

e. [(Table B + Table C) ÷ (Table A)] x 100 and averaged over the five years 1965-1969.

f. (Table D ÷ Table A) x 100 and averaged over the five years 1965-1969.

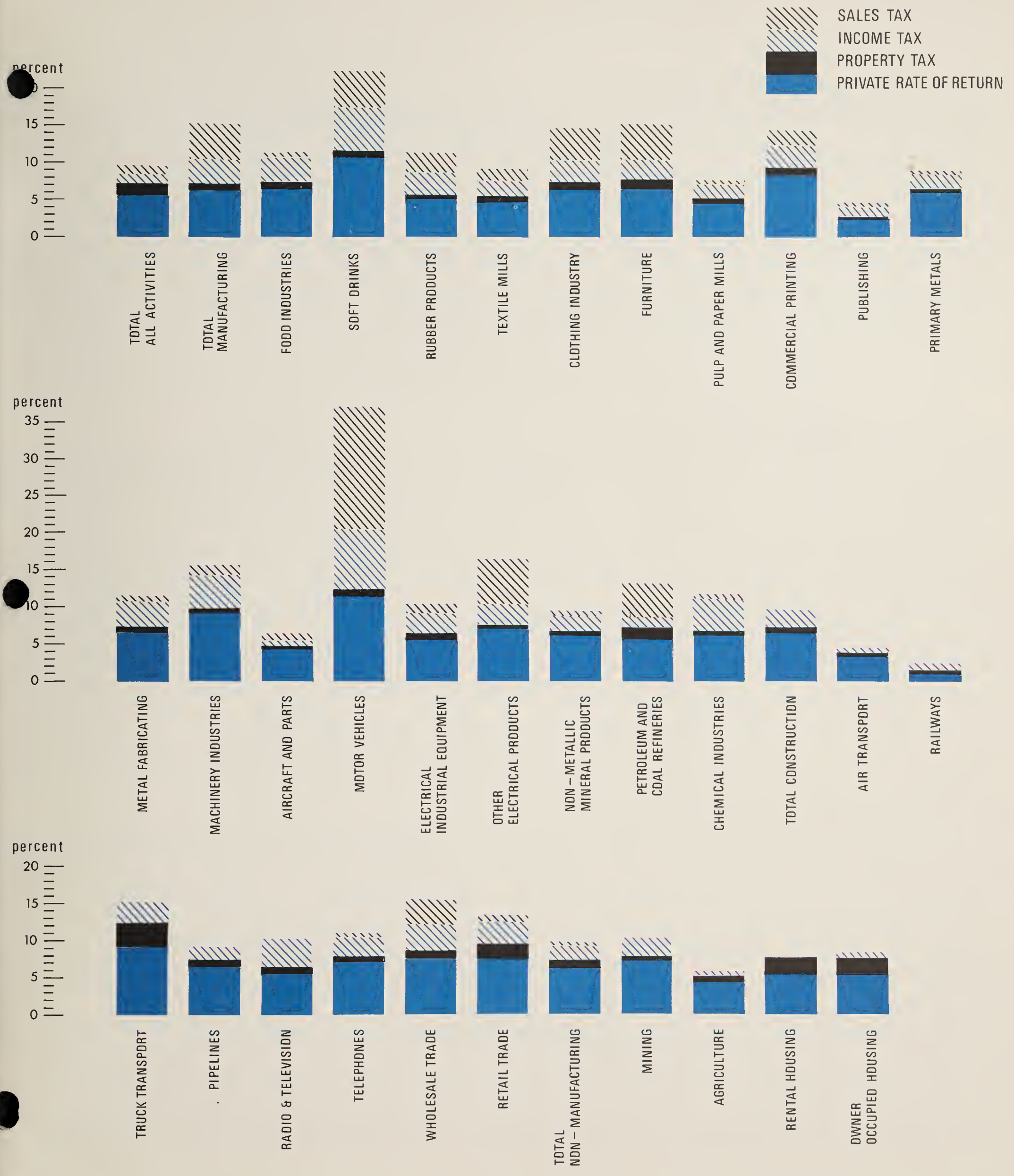
g. (Table E ÷ Table A) x 100 and averaged over the five years 1965-1969.

h. (Table F ÷ Table A) x 100 and averaged over the five years 1965-1969.

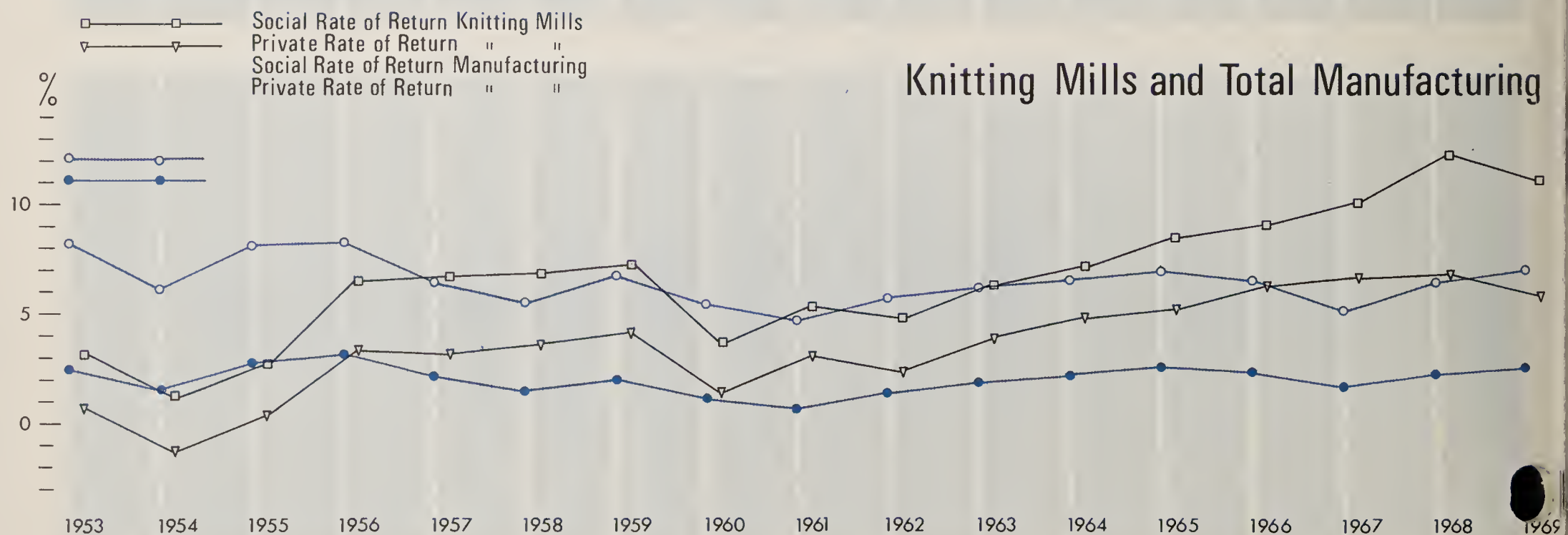
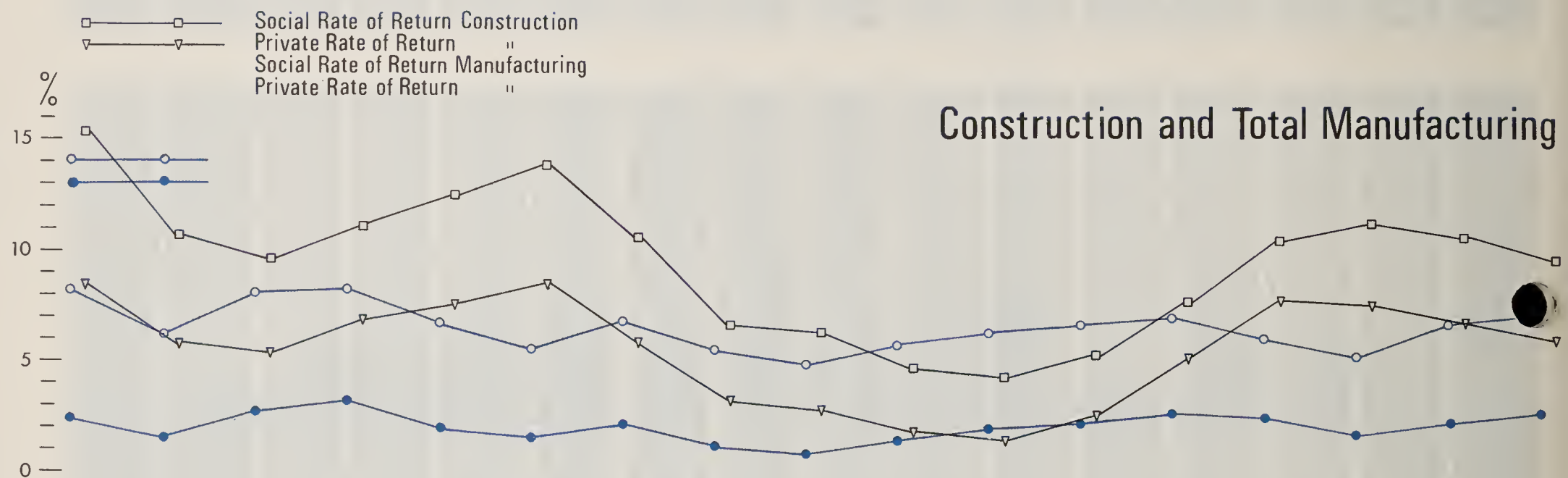
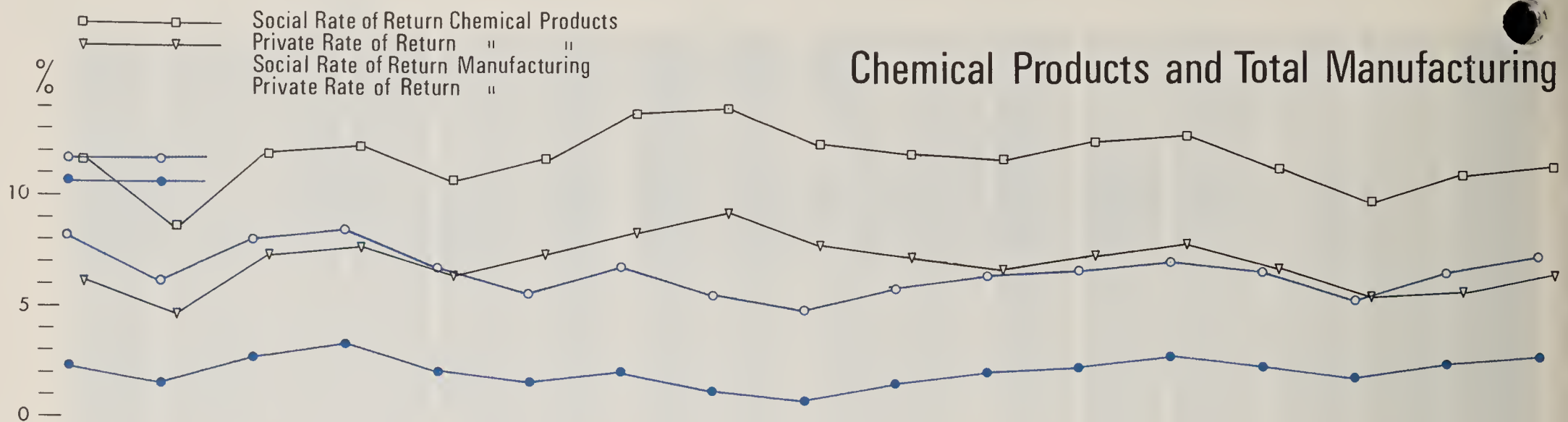
i. [(Table B + Table D + Table E) ÷ (Table A)] x 100 and averaged over the five years 1965-1969.

j. [(Table B + Table D + Table E + Table F) ÷ (Table A)] x 100 and averaged over the five years 1965-1969.

RATES OF RETURN AND EFFECTIVE TAXATION OF PRIVATE CAPITAL IN CANADA



COMPARISON OF RATES OF RETURN IN



SELECTED INDUSTRIES, 1953 - 1969

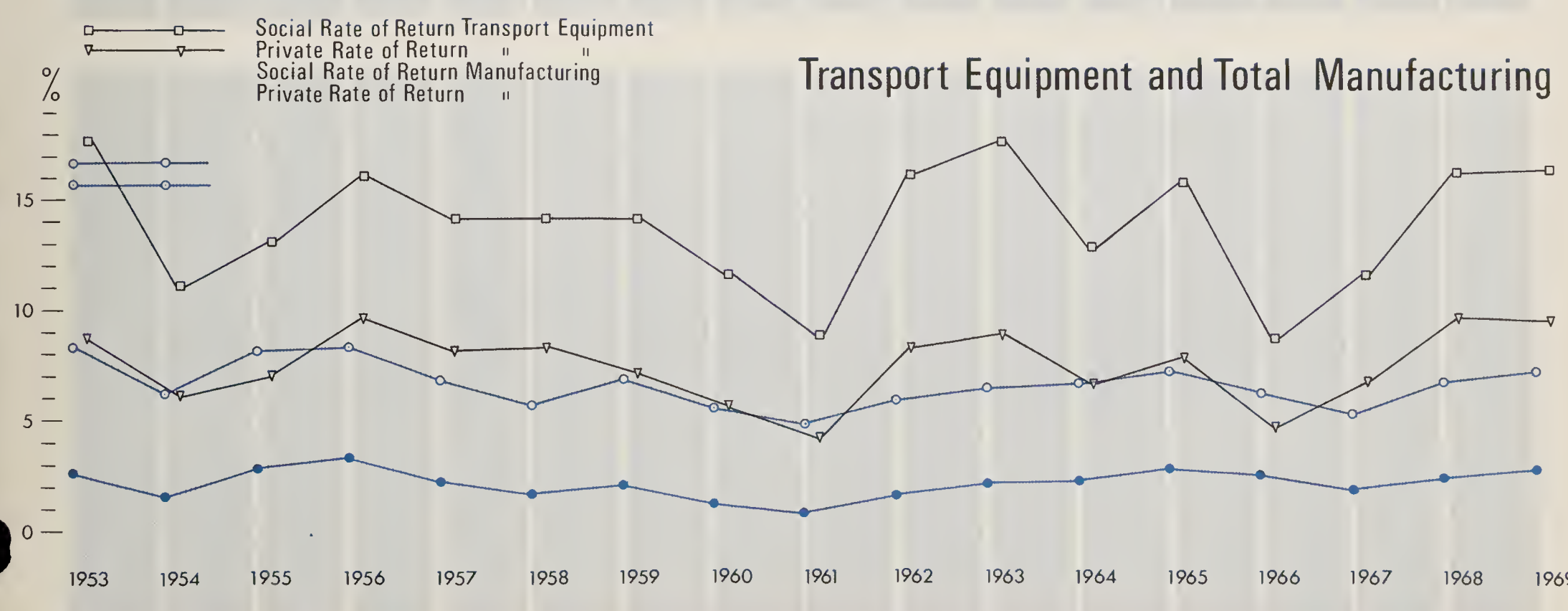
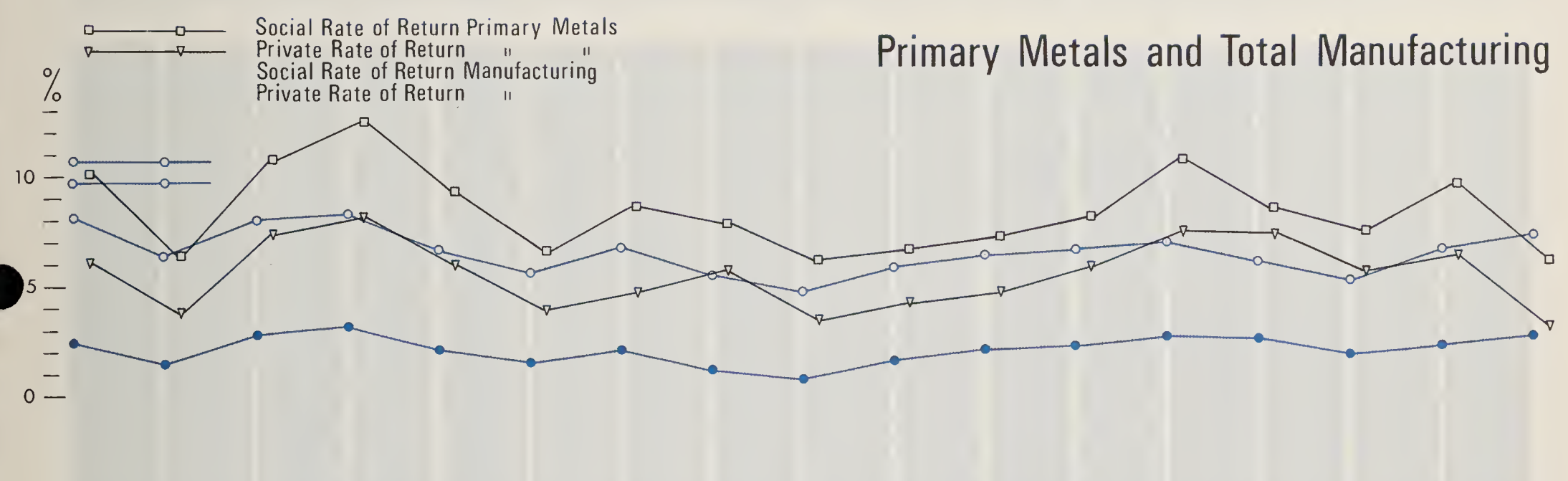
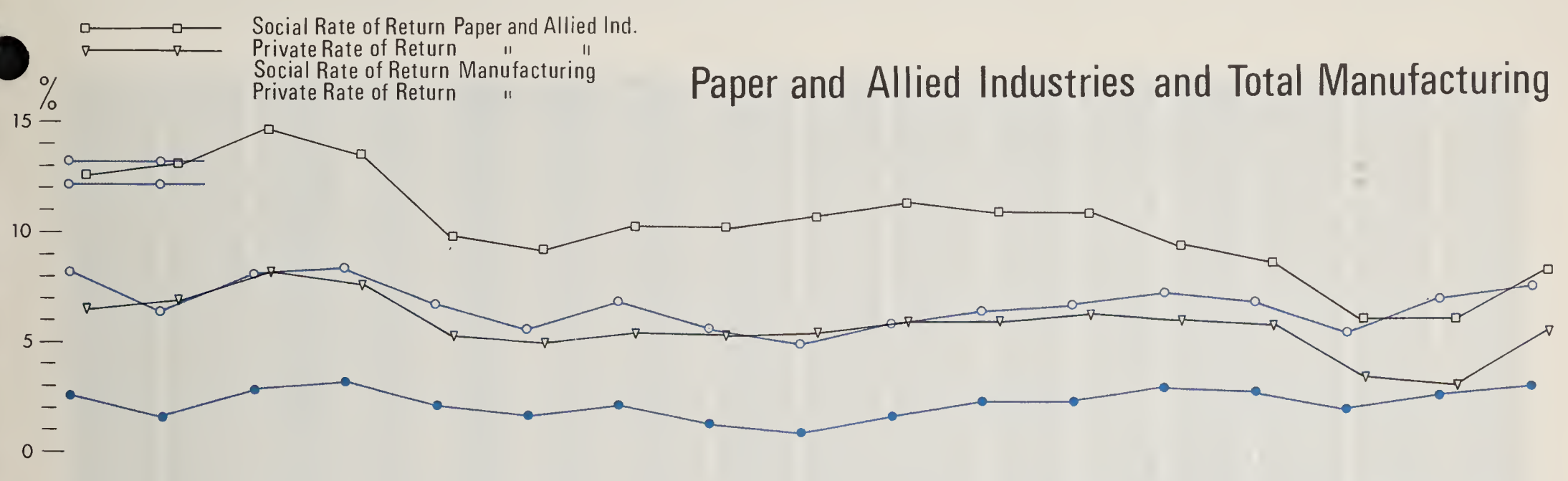


TABLE A
NET FIXED ASSETS AND WORKING CAPITAL
Current Cost Prices
(millions of dollars)

	Industry	1965	1966	1967	1968	1969
1.	Foods and Beverages	3367.0	3592.4	3758.1	3768.8	4051.5
	A. Food Industries	2610.7	2699.6	2839.2	2806.4	3058.2
	B. Soft Drinks	182.3	190.6	212.2	211.6	230.4
	C. Breweries and Wineries	660.6	761.8	733.8	764.2	883.3
2.	Tobacco Products	295.3	309.9	368.2	369.3	360.5
3.	Rubber Products	430.9	520.0	547.8	590.6	637.3
4.	Leather Products	147.0	178.8	172.6	187.0	223.0
5.	Textile Mills	1227.8	1392.0	1453.2	1498.4	1518.3
6.	Knitting Mills	170.2	167.7	175.0	165.3	197.6
7.	Clothing Industry	360.7	453.2	383.5	395.0	414.9
8.	Wood Industry	1208.2	1316.4	1367.0	1287.1	1436.6
9.	Furniture	182.3	240.7	278.0	302.1	339.1
10.	Pulp and Paper and Allied Ind.	4498.7	4772.1	5224.0	5398.0	5634.5
	A. Pulp and Paper Mills	4117.2	4186.4	4552.5	4679.6	5157.5
	B. Paper Boxes and Convertors	381.3	421.3	467.3	483.8	477.2
11.	Printing and Publishing	739.0	873.6	859.8	840.1	923.7
	A. Commercial Printing	364.5	439.5	433.9	412.2	508.4
	B. Publishing	299.9	343.1	327.5	322.8	238.0
12.	Primary Metals	4915.2	5214.0	5211.3	5205.9	4385.7
13.	Metal Fabricating	1676.0	1961.5	2108.7	2047.7	2267.8
14.	Machinery Industries	1223.0	1531.0	1580.5	1591.7	1866.1
15.	Transportation Equipment	1827.4	2496.8	2635.2	2668.6	3043.6
	A. Aircraft and Parts	355.9	510.8	573.0	531.7	597.9
	B. Motor Vehicles	1092.1	1224.4	1290.0	1298.7	1996.4
	C. Miscellaneous Transportation	379.1	453.8	415.6	461.9	449.2
16.	Electrical Industries	1349.2	1654.3	1756.1	1861.0	2019.6
	A. Electrical Industrial Equip.	498.5	556.0	624.5	634.2	692.5
	B. Other Electrical Products	850.6	1072.9	1063.8	1139.0	1327.3
17.	Non-Metallic Mineral Products	1216.0	1420.7	1470.6	1451.3	1546.4
18.	Petroleum and Coal Refineries	2858.5	3547.1	2540.2	2772.2	3252.6
19.	Chemical Industries	1973.7	2285.2	2421.0	2530.6	2560.6
20.	Miscellaneous Manufacturing	603.7	689.7	687.9	747.7	860.8
21.	Total Manufacturing	30270.7	34618.1	34999.6	35679.3	37541.1
22.	Total Construction	2499.6	2967.6	3163.0	3378.1	3903.4
	A. Building Contractors	1169.2	1332.0	1390.6	1475.8	1840.9
	B. Highway and Bridge Construction	465.6	478.5	509.7	518.0	579.9
23.	Total Transportation	9732.6	10506.5	11104.9	11992.9	12885.6
	A. Air Transport	313.9	358.1	464.5	628.4	844.2
	B. Water Transport	n.a.	1140.0	1190.5	1316.8	1366.8
	C. Railways	n.a.	6198.7	6438.8	6752.2	7167.2
	D. Truck Transport	479.2	578.3	569.2	621.1	707.7
	E. Pipelines	1725.1	1857.1	2039.3	2218.8	2486.3
24.	Storage	437.5	412.9	424.5	497.4	457.5
	A. Grain Elevators	301.9	298.4	314.5	389.9	349.7
	B. Storage and Warehouses	124.9	105.3	100.6	101.1	101.7
25.	Communications	3348.2	3821.6	4127.6	4428.5	4966.4
	A. Radio and Television	277.7	282.6	306.9	345.8	400.9
	B. Telephones	3054.4	3496.7	3767.8	4031.3	4593.1
26.	Public Utilities	1828.6	2021.7	2227.0	2354.3	2548.1
	A. Electrical Power	920.4	1028.8	1044.5	1062.3	1192.3
	B. Gas Distribution	873.8	1067.9	1133.8	1203.3	1313.1
27.	Wholesale Trade	4812.9	5483.2	6237.5	6777.2	7177.5
28.	Retail Trade	3675.6	4304.3	4623.7	4909.6	5513.9
29.	Total Finance, Insurance, and Real Estate	72369.8	72048.8	79977.0	90353.6	103454.0
	A. Trust Companies	3532.5	3911.7	4318.4	4934.9	5744.8
	B. Mortgage and Loan Companies	5214.5	5854.4	7530.8	8323.9	9524.5
	C. Banking	n.a.	27578.2	30442.8	35027.7	40618.4
	D. Total Deposit Accepting Institutions	34001.3	37344.5	42291.9	48285.6	55888.2
	E. Total Investment Companies	14441.7	16926.8	18532.2	21023.9	23854.5
a*29.	Total Finance, Insurance, and Real Estate	18167.7	19005.1	2115.8	23431.2	26270.7
	*A. Trust Companies	295.5	346.1	359.5	409.5	435.2
	*B. Mortgage and Loan Companies	503.1	548.5	640.4	698.4	834.6
	*C. Banking	n.a.	1347.6	1476.6	1488.2	1748.2
	*D. Total Deposit Accepting Institutions	2114.3	2242.3	2476.6	2595.3	3017.9
	*E. Total Investment Companies	10939.3	12584.3	13899.6	15853.1	17230.7
30.	Total Services	2719.8	3590.0	3741.5	4092.8	4862.3
	A. Services to Business and Management	225.3	359.2	386.9	408.5	483.0
	B. Personal, etc., Services	2573.6	3333.1	3447.7	3791.4	4501.7
31.	Total Non-Manufacturing	47223.0	52113.2	56765.8	61862.3	68585.7
32.	Mining	3542.7	3777.7	4185.9	4385.0	5713.0
33.	Mineral fuels	3023.1	3270.1	3921.5	4519.4	5072.5
	A. Mineral fuels and Petroleum Refineries	5881.7	6817.2	6461.8	7291.6	8325.1
34.	Agriculture	17217.8	19062.6	20952.6	22452.3	23356.2
35.	Rental Housing	15054.5	16930.6	18276.1	19876.4	22612.5
36.	Owner Occupied Housing	32737.7	36143.5	38658.8	41451.7	46328.0
37.	Trade (Non-Corporate)	2716.3	3132.0	3475.6	3739.8	4061.2
38.	Total All Activities	151786.0	169048.0	181236.1	193966.4	213270.4

a The values for the capital stock of financial intermediaries in the total for category 29 and the sub-categories 29A to 29E include all the fixed plus financial assets, while in the categories *29 and *29A through *29E the capital stock is taken to be the value of the equity of the corporation adjusted to reflect the current replacement values of the assets.

TABLE B
NET PRIVATE INCOME (EXCLUDING CAPITAL GAINS)
(millions of dollars)

	Industry	1965	1966	1967	1968	1969
1.	Foods and Beverages	269.1	282.2	268.5	301.5	363.4
	A. Food Industries	180.2	187.3	162.0	175.5	230.0
	B. Soft Drinks	19.5	20.6	27.0	22.3	21.5
	C. Breweries and Wineries	69.5	74.6	81.9	105.1	111.2
2.	Tobacco Products	19.3	23.3	26.5	23.9	25.5
3.	Rubber Products	17.9	26.6	32.7	29.1	35.6
4.	Leather Products	4.8	11.0	9.6	11.4	10.9
5.	Textile Mills	63.2	76.7	56.8	66.8	82.3
6.	Knitting Mills	9.0	10.4	11.8	11.3	11.8
7.	Clothing Industry	19.6	23.9	27.4	28.3	32.6
8.	Wood Industry	84.1	60.3	62.7	106.2	150.8
9.	Furniture	11.1	19.8	16.8	24.6	15.6
10.	Pulp and Paper and Allied Ind.	269.2	271.1	175.5	161.8	294.1
	A. Pulp and Paper Mills	242.7	242.5	147.9	137.8	261.8
	B. Paper Boxes and Convertors	26.3	28.5	27.6	31.3	36.4
11.	Printing and Publishing	69.2	80.3	80.4	80.9	91.6
	A. Commercial Printing	25.9	41.0	41.1	33.7	37.3
	B. Publishing	7.7	5.3	7.1	7.0	10.0
12.	Primary Metals	373.3	378.4	294.2	334.2	138.7
13.	Metal Fabricating	106.6	135.1	125.5	130.9	158.2
14.	Machinery Industries	102.3	143.3	149.9	138.8	178.6
15.	Transportation Equipment	143.3	115.5	181.1	259.1	292.7
	A. Aircraft and Parts	10.3	15.5	32.7	38.5	17.1
	B. Motor Vehicles	114.7	82.8	139.8	202.6	270.9
	C. Miscellaneous Transportation	18.6	17.2	8.6	18.0	25.1
16.	Electrical Industries	86.9	114.7	105.8	103.7	139.3
	A. Electrical Industrial Equip.	27.1	36.7	31.1	25.7	45.9
	B. Other Electrical Products	59.7	78.1	74.5	77.8	93.3
17.	Non-Metallic Mineral Products	85.2	94.8	80.0	70.6	100.1
18.	Petroleum and Coal Refineries	151.1	207.0	143.3	182.1	190.2
19.	Chemical Industries	157.3	149.8	127.1	140.7	161.2
20.	Miscellaneous Manufacturing	18.6	37.3	53.8	58.4	70.8
21.	Total Manufacturing	2061.3	2261.5	2029.4	2264.3	2544.0
22.	Total Construction	129.6	226.6	234.4	219.9	232.1
	A. Building Contractors	49.5	64.5	75.1	83.8	81.6
	B. Highway and Bridge Construction	19.1	41.1	43.0	31.5	25.7
23.	Total transportation	256.1	290.2	267.6	313.0	348.0
	A. Air Transport	24.5	20.3	9.4	9.8	3.4
	B. Water Transport	n.a.	23.0	29.1	30.2	23.8
	C. Railways	n.a.	35.9	-9	24.6	184.3
	D. Truck Transport	37.8	46.7	49.7	59.4	79.0
	E. Pipelines	127.2	126.6	133.1	137.1	147.2
24.	Storage	13.6	16.2	15.7	22.8	21.4
	A. Grain Elevators	7.0	9.1	10.2	15.3	13.3
	B. Storage and Warehouses	5.8	6.6	4.8	7.2	7.6
25.	Communications	212.7	230.5	305.6	331.5	367.7
	A. Radio and Television	16.6	14.6	17.0	15.8	29.2
	B. Telephones	192.9	213.1	285.9	311.9	334.5
26.	Public Utilities	92.3	115.7	124.2	137.5	143.9
	A. Electrical Power	48.2	44.0	54.7	52.9	61.1
	B. Gas Distribution	58.6	65.2	71.4	78.4	78.4
27.	Wholesale Trade	369.9	430.8	458.7	503.7	592.0
28.	Retail Trade	262.1	306.9	363.9	392.9	429.3
29.	Total Finance, Insurance, and Real Estate	1904.8	2834.0	3295.6	4643.6	5435.7
	A. Trust Companies	129.0	184.2	196.3	260.5	337.1
	B. Mortgage and Loan Companies	258.8	302.3	385.2	449.1	491.4
	C. Banking	n.a.	757.3	878.9	1195.3	1688.1
	D. Total Deposit Accepting Institutions	384.2	1243.8	1460.6	1905.0	2516.7
	E. Total Investment Companies	732.6	801.2	901.8	1064.4	1559.9
a*29.	Total Finance, Insurance, and Real Estate	1033.7	1045.3	1250.1	2054.9	2056.9
	*A. Trust Companies	20.6	20.8	23.4	26.3	31.7
	*B. Mortgage and Loan Companies	54.1	63.4	70.7	75.2	51.8
	*C. Banking	n.a.	117.2	124.8	147.8	124.1
	*D. Total Deposit Accepting Institutions	68.1	201.3	219.0	249.3	207.5
	*E. Total Investment Companies	648.6	674.0	773.7	897.0	1372.4
30.	Total Services	247.5	336.2	354.4	423.1	541.0
	A. Services to Business and Management	34.8	58.0	58.4	61.0	123.2
	B. Personal, etc., Services	230.6	299.0	316.7	386.3	444.2
31.	Total Non-Manufacturing	2617.5	2998.4	3374.6	4399.3	4732.3
32.	Mining	241.0	277.8	307.7	397.3	356.1
33.	Mineral fuels	144.0	139.9	201.0	212.0	297.9
	A. Mineral fuels and Petroleum Refineries	295.0	346.9	344.3	394.1	488.1
34.	Agriculture	594.4	819.5	575.6	453.7	156.6
b**34.	Agriculture	901.1	1101.7	917.1	834.7	562.0
35.	Rental Housing	806.9	885.4	977.7	1097.1	1232.3
36.	Owner Occupied Housing	1754.7	1890.3	2068.2	2288.1	2524.8
37.	Trade (Non-Corporate)	202.2	236.0	263.2	286.9	326.8
38.	Total All Activities	8728.9	9791.2	10139.0	11779.9	12576.5

a Private income to capital from financial intermediaries in the categories *29 and *29A through *29B includes only income accruing to the equity holders of the companies.

b Private income to capital from agriculture in category 34 was estimated after assuming that all non-wage labour in agriculture received an income for their labour equal to that received by the hired workers. In category **34 it was assumed that only owners and employers in agriculture received a wage equal to that of the hired worker, and the labour of family help had a zero social opportunity cost.

TABLE C
CAPITAL GAINS AND LOSSES ON BUILDINGS AND EQUIPMENT IN CURRENT PRICES
(millions of dollars)

	Industry	1965	1966	1967	1968	1969
1.	Foods and Beverages	71.7	.8	-141.9	-82.2	-3.6
	A. Food Industries	54.8	.6	-107.8	-62.7	-2.7
	B. Soft Drinks	4.3	.0	-9.3	-5.2	-.2
	C. Breweries and Wineries	12.4	.1	-24.7	-14.2	-.6
2.	Tobacco Products	3.5	.4	-6.0	-4.3	-.1
3.	Rubber Products	7.8	.3	-16.3	-12.4	-1.0
4.	Leather Products	2.1	.7	-3.2	-2.5	-.0
5.	Textile Mills	16.5	-.9	-58.8	-38.7	-12.8
6.	Knitting Mills	1.3	-1.5	-5.5	-3.1	-2.9
7.	Clothing Industry	1.9	-1.2	-5.5	-3.4	-2.1
8.	Wood Industry	11.5	-12.2	-20.8	-41.6	-16.9
9.	Furniture	1.6	-.5	-3.8	-6.1	-2.0
10.	Pulp and Paper and Allied Ind.	114.7	-33.6	-218.9	-116.2	-33.2
	A. Pulp and Paper Mills	107.0	-31.2	-202.5	-177.2	-31.0
	B. Paper Boxes and Convertors	7.7	-2.3	-16.4	-13.1	-2.1
11.	Printing and Publishing	24.8	9.3	-32.8	-26.8	-10.1
	A. Commercial Printing	11.7	4.5	-16.0	-12.6	-5.3
	B. Publishing	13.1	4.8	-16.7	-14.1	-4.7
12.	Primary Metals	125.5	-4.8	-234.9	-164.1	-11.9
13.	Metal Fabricating	34.4	5.9	-66.4	-36.3	11.5
14.	Machinery Industries	24.2	3.6	-43.3	-25.3	8.3
15.	Transportation Equipment	44.3	3.0	-93.7	-52.4	17.2
	A. Aircraft and Parts	7.5	.5	-16.2	-8.7	2.6
	B. Motor Vehicles	29.7	2.1	-65.3	-35.7	12.0
	C. Miscellaneous Transportation	7.1	.4	-12.1	-7.9	2.5
16.	Electrical Industries	21.1	-.9	-41.7	-32.3	-3.0
	A. Electrical Industrial Equip.	7.7	-.3	-14.5	-11.5	-.1
	B. Other Electrical Products	13.4	-.6	-27.2	-20.9	-1.9
17.	Non-Metallic Mineral Products	30.7	-2.4	-61.4	-44.5	-4.4
18.	Petroleum and Coal Refineries	71.7	-5.7	-99.0	-79.2	-5.9
19.	Chemical Industries	53.8	-5.0	-77.1	-80.0	-21.4
20.	Miscellaneous Manufacturing	8.9	1.2	-15.3	-12.9	-.9
21.	Total Manufacturing	673.2	-43.4	-1247.1	-865.1	-96.1
22.	Total Construction	-3.6	-17.5	-18.7	-3.5	-2.7
	A. Building Contractors	-1.1	-5.7	-1.7	1.1	-.9
	B. Highway and Bridge Construction	-1.2	-5.8	-1.7	1.0	-.7
23.	Total Transportation	-182.2	-298.7	-287.2	11.2	-384.0
	A. Air Transport	-3.5	-7.3	-10.9	-.3	-23.6
	B. Water Transport	n.a.	-32.2	-31.8	.8	-40.9
	C. Railways	n.a.	-177.7	-167.0	6.6	-214.1
	D. Truck Transport	-2.4	-8.5	-13.9	-3.1	-15.2
	E. Pipelines	-40.7	-61.3	-54.7	6.5	-83.1
24.	Storage	12.7	5.8	-10.8	-8.3	2.8
	A. Grain Elevators	7.8	4.3	-7.3	-6.1	1.9
	B. Storage and Warehouses	4.2	.9	-3.3	-2.1	.7
25.	Communications	15.3	-65.4	-134.7	-112.3	-64.7
	A. Radio and Television	2.6	-2.1	-8.8	-7.8	-3.0
	B. Telephones	13.4	-62.1	-125.4	-104.0	-61.4
26.	Public Utilities	10.0	-81.7	-154.1	-173.7	-76.5
	A. Electrical Power	5.1	-42.9	-74.5	-80.6	-36.7
	B. Gas Distribution	4.6	-42.0	-77.6	-87.3	-38.7
27.	Wholesale Trade	17.8	19.6	-37.7	-39.1	-20.1
28.	Retail Trade	17.5	22.5	-39.5	-39.7	-21.0
29.	Total Finance, Insurance, and Real Estate	215.3	178.9	-273.9	-229.3	27.5
	A. Trust Companies	2.0	1.3	-2.0	-1.6	.2
	B. Mortgage and Loan Companies	5.7	3.5	-5.0	-3.7	.4
	C. Banking	n.a.	8.9	-13.7	-11.3	1.4
	D. Total Deposit Accepting Institutions	21.1	13.8	-20.8	-16.7	2.1
	E. Total Investment Companies	14.5	11.0	-16.3	-13.1	2.1
30.	Total Services	80.1	62.1	-102.3	-90.7	1.4
	A. Services to Business and Management	1.5	1.0	-4.5	-4.1	-2.8
	B. Personal, etc., Services	89.4	71.3	-105.2	-90.5	12.8
31.	Total Non-Manufacturing	183.2	-174.3	-1059.2	-685.7	-537.3
32.	Mining					
33.	Mineral fuels					
	A. Mineral fuels and Petroleum Refineries					
34.	Agriculture	484.9	586.5	906.6	71.7	499.5
35.	Rental Housing	13.5	606.1	405.7	524.7	847.9
36.	Owner Occupied Housing	29.4	1293.9	858.2	1094.3	1737.3
37.	Trade (non-corporate)	11.3	13.4	-24.7	-25.2	-13.1

TABLE D
PROPERTY TAXES PAID IN CURRENT PRICES
(millions of dollars)

	Industry	1965	1966	1967	1968	1969
1.	Foods and Beverages	23.4	26.5	30.3	31.7	35.6
	A. Food Industries	18.5	20.0	22.6	24.3	23.0
	B. Soft Drinks	1.2	2.0	2.3	2.1	1.8
	C. Breweries and Wineries	3.8	4.5	5.4	5.4	6.8
2.	Tobacco Products	2.0	1.2	1.0	1.1	.8
3.	Rubber Products	1.5	1.9	2.3	2.4	3.2
4.	Leather Products	1.6	1.7	1.9	2.1	2.3
5.	Textile Mills	5.6	5.6	6.8	9.5	8.6
6.	Knitting Mills	1.2	1.1	1.3	1.8	2.0
7.	Clothing Industry	2.5	3.3	3.2	3.7	4.9
8.	Wood Industry	5.2	6.6	6.2	7.5	8.2
9.	Furniture	1.5	2.6	3.3	5.9	4.3
10.	Pulp and Paper and Allied Ind.	24.8	26.7	28.5	34.8	28.7
	A. Pulp and Paper Mills	21.6	22.3	23.1	28.2	23.0
	B. Paper Boxes and Convertors	3.2	4.4	5.5	6.6	4.4
11.	Printing and Publishing	5.2	5.7	5.5	7.1	7.3
	A. Commercial Printing	2.9	3.2	3.1	3.7	3.9
	B. Publishing	.2	.3	.4	.6	.3
12.	Primary Metals	9.6	13.2	10.4	12.8	10.3
13.	Metal Fabricating	10.1	12.6	14.1	15.0	16.2
14.	Machinery Industries	5.4	6.5	6.0	8.8	8.8
15.	Transportation Equipment	13.5	12.5	14.1	15.7	17.7
	A. Aircraft and Parts	1.6	2.1	2.8	2.6	1.3
	B. Motor Vehicles	9.9	8.1	7.9	9.7	11.6
	C. Miscellaneous Transportation	2.0	2.3	3.4	3.3	3.1
16.	Electrical Industries	6.3	7.1	7.8	8.8	9.7
	A. Electrical Industrial Equip.	3.6	3.9	4.6	5.0	4.9
	B. Other Electrical Products	2.7	3.3	3.1	3.9	4.1
17.	Non-Metallic Mineral Products	5.3	5.8	7.9	6.6	7.4
18.	Petroleum and Coal Refineries	49.0	51.4	22.3	24.3	55.7
19.	Chemical Industries	7.8	10.3	10.4	12.0	12.3
20.	Miscellaneous Manufacturing	4.4	3.5	4.8	6.1	7.3
21.	Total Manufacturing	185.9	205.9	188.2	218.1	251.3
22.	Total Construction	15.1	15.5	19.8	28.1	31.2
	A. Building Contractors	9.2	8.6	11.4	15.7	13.4
	B. Bridge and Highway Construction	1.6	1.9	2.2	2.2	2.7
23.	Total Transportation	69.1	85.0	83.2	112.1	114.2
	A. Air Transport	1.2	1.4	1.9	2.4	2.2
	B. Water Transport	n.a.	2.4	2.5	2.9	2.4
	C. Railways	n.a.	51.7	43.0	63.0	19.0
	D. Truck Transport	7.7	14.6	19.2	25.7	32.4
	E. Pipelines	14.8	10.3	11.5	13.2	16.0
24.	Storage	4.1	4.9	5.0	8.5	7.4
	A. Grain Elevators	1.4	1.4	1.6	3.4	2.7
	B. Storage and Warehouses	2.7	3.5	3.4	5.1	4.2
25.	Communications	30.7	22.4	26.4	44.5	51.9
	A. Radio and Television	1.4	1.3	1.6	1.5	2.4
	B. Telephones	29.3	20.9	24.8	43.0	49.3
26.	Public Utilities	15.9	18.4	19.6	23.3	23.2
	A. Electrical Power	7.5	8.6	8.2	9.3	8.5
	B. Gas Distribution	8.3	9.5	11.2	13.3	14.0
27.	Wholesale Trade	34.4	37.2	48.1	54.6	59.2
28.	Retail Trade	50.1	67.8	74.9	81.3	103.1
29.	Total Finance, Insurance, and Real Estate	133.4	163.8	203.0	234.6	250.9
	A. Trust Companies	1.2	1.9	1.8	2.0	1.9
	B. Mortgage and Loan Companies	.6	.6	1.0	1.0	2.8
	C. Banking	n.a.	5.1	5.9	7.1	4.5
	D. Total Deposit Accepting Institutions	1.8	7.6	8.7	10.1	9.2
	E. Total Investment Companies	4.7	8.6	8.4	12.5	6.9
30.	Total Services	38.0	46.3	53.4	65.4	76.8
	A. Services to Business and Management	2.2	3.1	4.2	4.1	6.4
	B. Personal, etc., Services	35.0	43.3	49.2	61.3	70.5
31.	Total Non-Manufacturing	390.8	461.3	533.4	652.4	717.9
32.	Mining	12.9	13.7	15.5	17.2	24.1
33.	Mineral fuels		6.7	17.3	25.3	18.9
	A. Mineral fuels and Petroleum Refineries	366.6	237.1	324.1	412.4	402.9
34.	Agriculture	143.0	155.5	165.4	175.2	185.6
35.	Rental Housing	353.7	399.5	464.2	512.8	585.6
36.	Owner Occupied Housing	769.3	852.9	981.9	1069.4	1199.8
37.	Trade (non-corporate)	27.0	33.6	39.3	43.4	51.9
38.	Total All Activities	2200.3	2308.3	2689.8	3112.0	3382.5

TABLE E
INCOME TAXES PAID IN CURRENT PRICES
(millions of dollars)

Industry		1965	1966	1967	1968	1969
1.	Foods and Beverages	166.9	171.4	176.8	204.2	227.8
	A. Food Industries	96.6	91.1	83.2	100.1	119.2
	B. Soft Drinks	9.8	11.3	13.3	13.3	12.1
	C. Breweries and Wineries	60.4	69.0	77.7	89.4	96.4
2.	Tobacco Products	20.7	17.1	23.9	24.0	23.5
3.	Rubber Products	10.8	14.5	19.2	23.2	24.3
4.	Leather Products	4.2	4.4	3.3	6.1	6.6
5.	Textile Mills	30.7	29.6	19.2	37.7	46.5
6.	Knitting Mills	4.1	3.6	4.5	7.0	8.1
7.	Clothing Industry	8.6	10.6	10.6	15.0	15.3
8.	Wood Industry	23.8	22.4	27.0	54.3	66.9
9.	Furniture	4.6	7.4	6.3	9.1	9.7
10.	Pulp and Paper and Allied Ind.	124.0	105.1	101.6	107.7	126.1
	A. Pulp and Paper Mills	105.3	84.1	75.9	80.3	100.7
	B. Paper Boxes and Convertors	18.8	29.0	25.7	26.7	25.5
11.	Printing and Publishing	30.5	39.0	56.9	53.2	62.1
	A. Commercial Printing	9.0	14.1	15.5	16.0	19.4
	B. Publishing	2.9	4.2	5.6	5.8	6.5
12.	Primary Metals	152.0	53.9	86.5	157.2	115.3
13.	Metal Fabricating	68.2	75.8	69.9	75.5	89.0
14.	Machinery Industries	60.7	68.9	65.1	73.0	91.4
15.	Transportation Equipment	131.7	88.1	107.2	159.9	186.6
	A. Aircraft and Parts	2.5	3.3	2.0	5.1	4.4
	B. Motor Vehicles	117.0	72.1	86.7	135.8	162.2
	C. Miscellaneous Transportation	12.0	12.7	18.7	19.0	19.9
16.	Electrical Industries	48.1	64.9	48.2	45.2	54.5
	A. Electrical Industrial Equip.	19.4	25.6	16.5	9.8	8.1
	B. Other Electrical Products	28.7	39.3	32.1	35.4	46.5
17.	Non-Metallic Mineral Products	33.8	34.1	28.0	34.0	39.1
18.	Petroleum and Coal Refineries	38.3	55.8	28.0	41.3	40.1
19.	Chemical Industries	83.2	93.3	92.8	120.4	112.9
20.	Miscellaneous Manufacturing	28.7	31.6	34.1	40.1	50.2
21.	Total Manufacturing	1073.8	991.4	999.2	1288.1	1396.1
22.	Total Construction	48.5	66.2	94.1	106.9	106.5
	A. Building Contractors	16.8	21.8	35.5	38.2	43.5
	B. Bridge and Highway Construction	8.5	8.8	16.2	20.6	17.4
23.	Total Transportation	106.0	137.1	116.6	116.1	117.2
	A. Air Transport	.9	2.6	2.5	.6	.7
	B. Water Transport	n.a.	7.2	9.0	7.6	10.1
	C. Railways	n.a.	61.9	41.0	41.9	30.1
	D. Truck Transport	9.0	16.5	17.1	18.2	20.3
	E. Pipelines	35.6	40.6	36.8	37.9	45.7
24.	Storage	4.4	5.8	6.8	4.7	4.3
	A. Grain Elevators	3.7	4.2	4.9	1.8	1.3
	B. Storage and Warehouses	.7	1.6	2.0	2.9	2.9
25.	Communications	113.4	117.6	90.2	98.7	111.9
	A. Radio and Television	9.7	10.4	11.7	13.4	19.7
	B. Telephones	103.7	107.2	78.3	85.3	92.3
26.	Public Utilities	31.1	36.9	40.4	43.8	43.0
	A. Electrical Power	19.8	21.6	21.4	20.6	20.9
	B. Gas Distribution	11.3	15.3	19.0	21.7	21.6
27.	Wholesale Trade	168.4	211.8	211.4	248.9	261.0
28.	Retail Trade	131.3	145.2	160.3	178.5	198.0
29.	Total Finance, Insurance, and Real Estate	245.9	265.1	288.0	349.2	528.2
	A. Trust Companies	13.9	14.8	12.3	14.6	18.6
	B. Mortgage and Loan Companies	16.0	9.2	12.4	12.8	18.6
	C. Banking	n.a.	98.4	107.8	120.2	234.1
	D. Total Deposit Accepting Institutions	116.2	122.4	132.4	147.6	271.2
	E. Total Investment Companies	35.2	33.6	39.6	64.7	62.9
30.	Total Services	52.5	73.3	94.9	93.7	117.4
	A. Services to Business and Management	16.7	28.3	27.0	27.6	37.2
	B. Personal, etc., Services	35.8	45.0	67.9	66.1	80.2
31.	Total Non-Manufacturing	901.5	1059.0	1102.7	1240.5	1487.5
32.	Mining	89.9	89.9	91.9	111.5	144.9
33.	Mineral fuels	11.5	17.5	58.9	39.8	35.7
	A. Mineral fuels and Petroleum Refineries	49.8	73.3	86.9	81.1	75.8
34.	Agriculture	-81.7	-68.4	-159.1	-187.9	-171.8
35.	Rental Housing					
36.	Owner Occupied Housing	-219.3	-234.9	-259.0	-286.0	-315.0
37.	Trade (non-corporate)	nil	nil	nil	nil	nil
38.	Total All Activities	1775.5	1854.3	1834.5	2205.9	2577.3

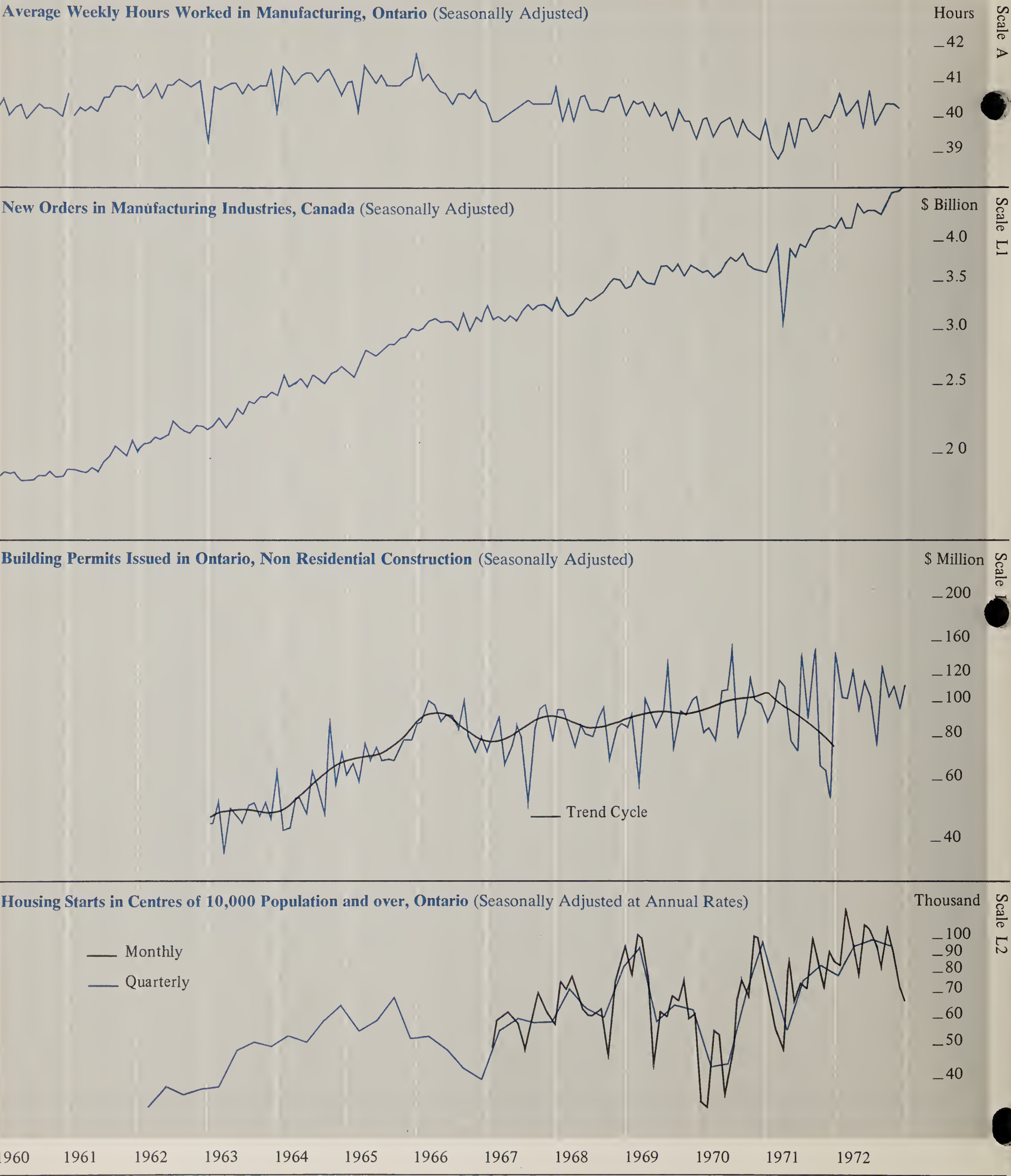
TABLE F
TOTAL SALES TAXES PAID ON THE INCOME FROM CAPITAL
(millions of dollars)

	Industry	1965	1966	1967	1968	1969
1.	Foods and Beverages	441.4	486.8	610.8	675.6	731.1
	A. Food Industries	9.3	10.0	12.0	12.4	13.0
	B. Soft Drinks	7.1	8.4	11.0	12.2	13.6
	C. Breweries and Wineries	424.8	468.2	587.7	651.0	704.4
2.	Tobacco Products	332.9	375.0	433.7	439.6	453.7
3.	Rubber Products	10.1	12.1	14.9	15.8	16.8
4.	Leather Products	4.3	6.1	6.3	7.4	8.1
5.	Textile Mills	15.9	18.1	19.6	21.9	23.6
6.	Knitting Mills	7.0	8.8	10.1	11.3	12.0
7.	Clothing Industry	13.5	18.3	17.6	19.0	21.2
8.	Wood Industry	1.4	1.6	1.9	1.9	2.3
9.	Furniture	7.9	11.4	12.9	13.8	15.9
10.	Pulp and Paper and Allied Ind.	8.5	9.1	11.3	11.6	12.9
	A. Pulp and Paper Mills	4.1	4.2	4.9	5.3	6.0
	B. Paper Boxes and Convertors	4.4	4.9	6.3	6.2	6.8
11.	Printing and Publishing	6.5	7.7	9.3	9.3	10.7
	A. Commercial Printing	5.9	7.1	8.6	8.6	9.8
	B. Publishing	.4	.5	.6	.6	.8
12.	Primary Metals	11.9	12.8	13.7	14.9	12.5
13.	Metal Fabricating	10.3	12.2	14.1	14.3	15.8
14.	Machinery Industries	19.4	23.2	26.0	25.7	28.7
15.	Transportation Equipment	148.5	174.5	233.0	289.2	361.7
	A. Aircraft and Parts	2.6	4.2	5.7	6.3	5.4
	B. Motor Vehicles	144.8	165.4	221.4	276.3	349.2
	C. Miscellaneous Transportation	.9	4.7	5.9	6.5	7.1
16.	Electrical Industries	51.3	66.5	79.4	85.2	92.1
	A. Electrical Industrial Equip.	5.9	6.8	8.2	8.0	8.9
	B. Other Electrical Products	45.3	59.7	71.1	77.1	83.2
17.	Non-Metallic Mineral Products	5.5	6.6	7.5	7.4	8.2
^a 18.	Petroleum and Coal Refineries	152.6	179.0	115.0	115.6	145.4
19.	Chemical Industries	20.5	22.1	24.5	18.6	20.0
20.	Miscellaneous Manufacturing	19.6	20.0	23.3	25.7	30.9
21.	Total Manufacturing	1289.6	1472.6	1685.6	1824.6	2024.2
22.	Total Construction					
	A. Building Contractors					
	B. Bridge and Highway Construction					
23.	Total Transportataon					
	A. Air Transport					
	B. Water Transport					
	C. Railways					
	D. Truck Transport					
	E. Pipelines					
24.	Storage					
	A. Grain Elevators					
	B. Storage and Warehouses					
25.	Communications	9.8	16.4	21.9	26.7	29.3
	A. Radio and Television					
	B. Telephones	9.8	16.4	21.9	26.7	29.3
26.	Public Utilities	11.9	9.5	13.9	14.5	18.6
	A. Electrical Power	7.4	4.7	6.9	7.7	8.1
	B. Gas Distribution	4.5	4.8	7.0	6.8	10.5
27.	Wholesale Trade	16.5	25.2	35.6	42.3	50.9
28.	Retail Trade	12.8	19.3	29.7	34.3	40.8
29.	Total Finance, Insurance, and Real Estate					
	A. Trust Companies					
	B. Mortgage and Loan Companies					
	C. Banking					
	D. Total Deposit Accepting Institutions					
	E. Total Investment Companies					
30.	Total Services	4.4	6.0	6.6	7.7	9.2
	A. Services to Business and Management					
	B. Personal, etc., Services	4.4	6.0	6.6	7.7	9.2
31.	Total Non-Manufacturing	55.4	76.4	107.7	125.5	148.8
32.	Mining					
33.	Mineral fuels					
^a 33.	A. Mineral fuels and Petroleum Refineries	152.6	179.0	115.0	115.6	145.4
34.	Agriculture					
35.	Rental Housing					
36.	Owner Occupied Housing					
37.	Trade (non-corporate)	8.7	13.0	18.3	21.7	26.5
38.	Total All Activities	1353.7	1562.0	1811.6	1971.8	2199.5

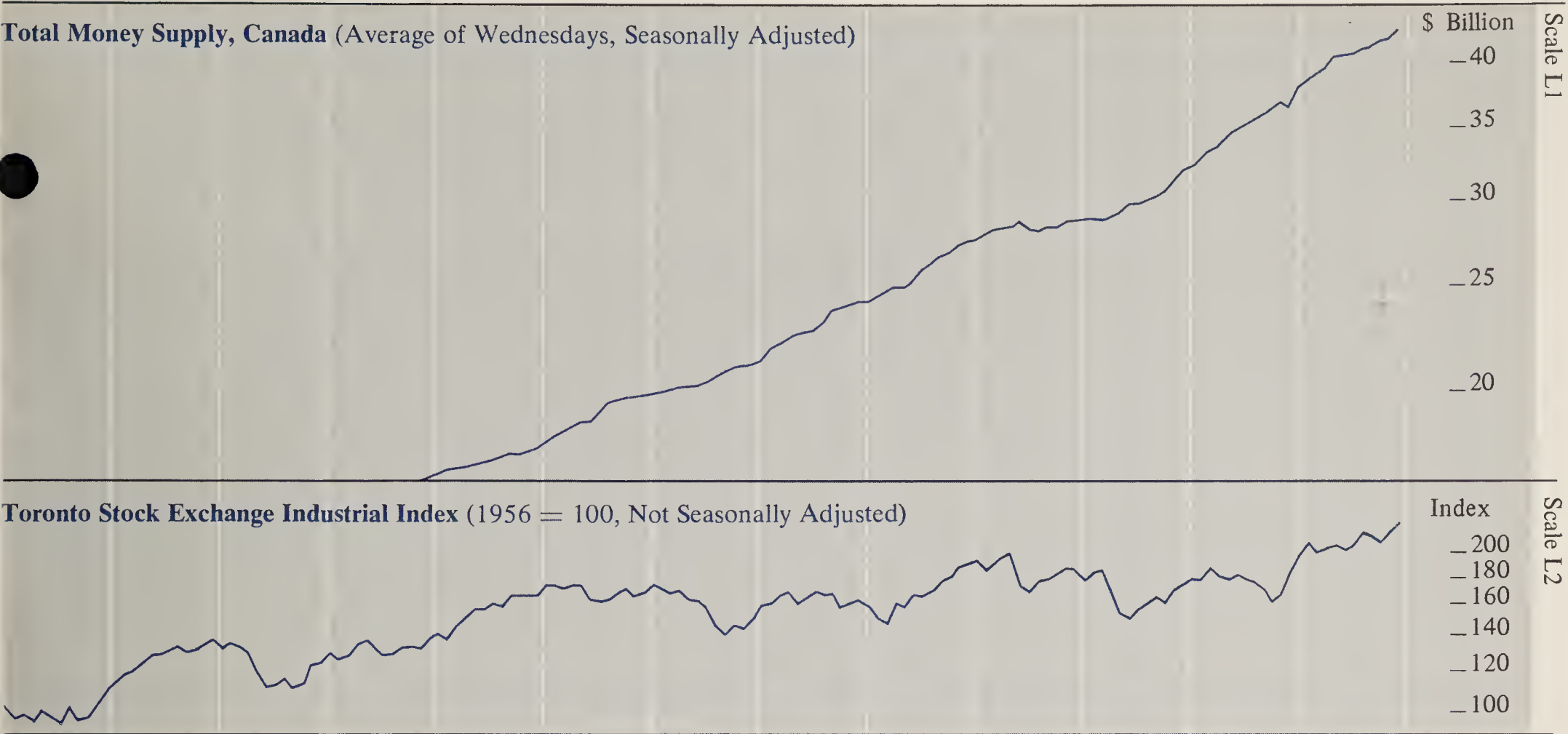
^aThe sales taxes on petroleum do not include the gasoline taxes.

Selected Economic Indicators

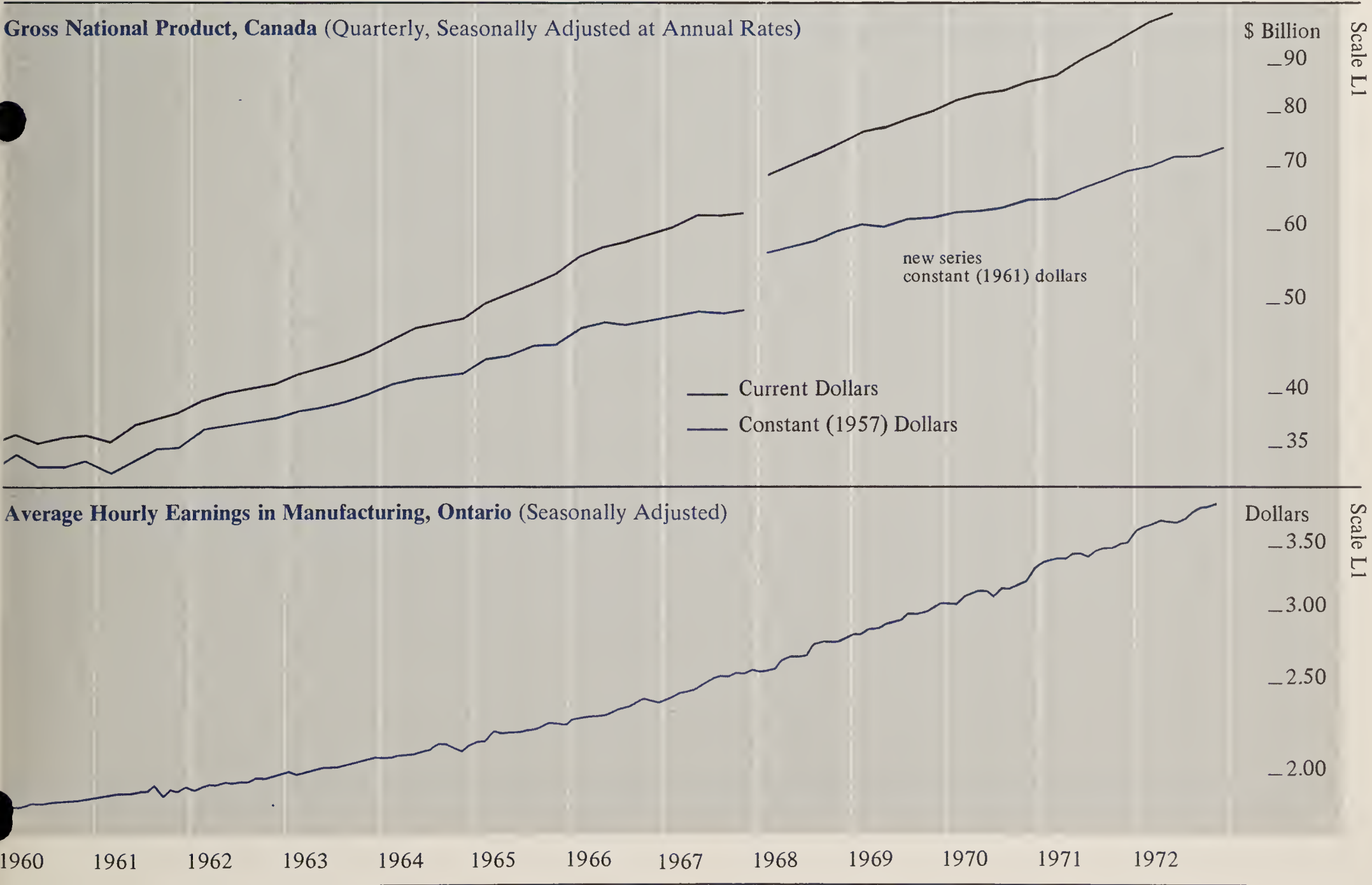
Leading Indicators



Leading Indicators



Coincidental and Lagging Indicators



Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent

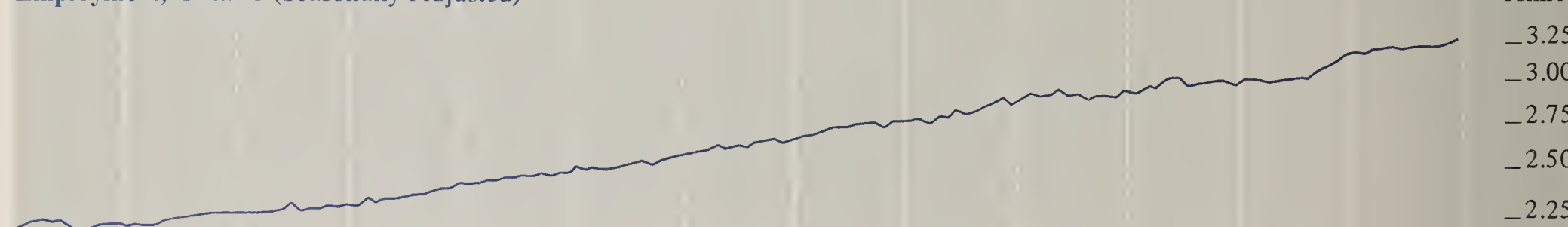
Scale A



Employment, Ontario (Seasonally Adjusted)

Million

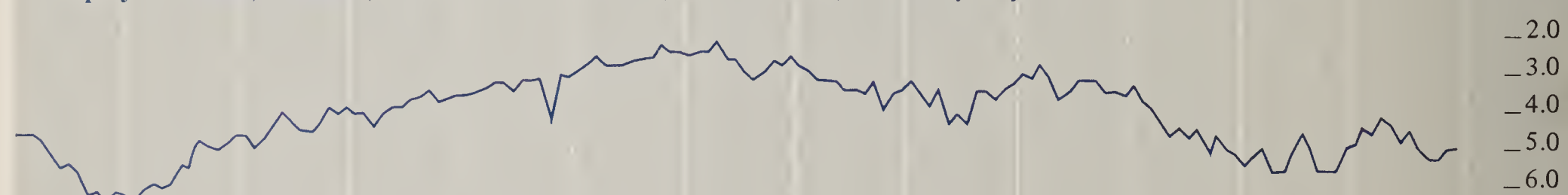
Scale L1



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)

Per Cent

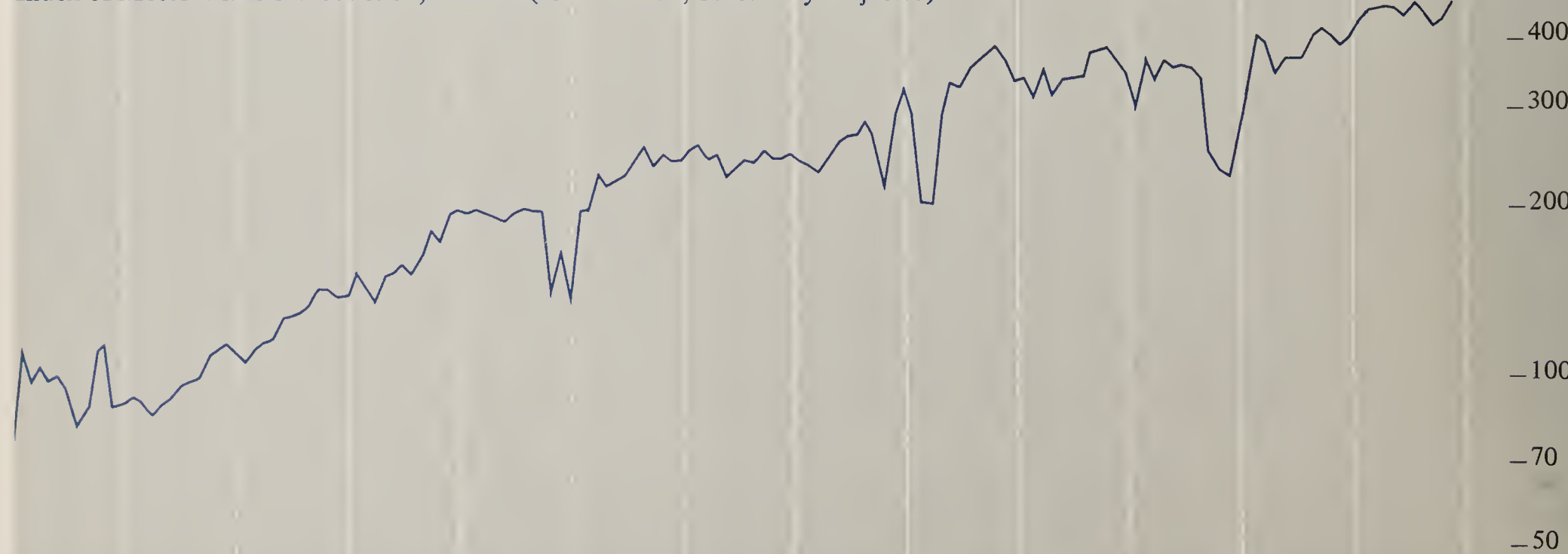
Scale A



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index

Scale L2



1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

		1971												1972											
		Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.										
Leading Indicators																									
Average Weekly Hours Worked in Manufacturing		Number	40.0	40.4	40.7	40.1	40.2	40.5	39.7	40.8	39.8	40.1	40.4	40.4	40.2	40.5									
New Orders in Manufacturing Industries ^c		\$ Million	4,267.0	4,216.1	4,368.1	4,213.4	4,234.7	4,563.0	4,439.8	4,488.0	4,459.5	4,402.2	4,561.6	4,745.0	4,760.4	4,836.0									
Building Permits Issued in Ontario, Non-Residential Construction		\$ Million	53.1	139.6	103.4	102.5	123.2	95.1	114.7	104.7	76.7	128.2	104.7	110.4	96.7	112.4									
Urban Housing Starts (Annual Rate)		Number	98,500	77,500	82,900	123,100	94,000	78,700	108,600	106,700	97,000	82,700	108,500	91,600	71,800	66,500									
Money Supply ^c		\$ Million	37,016	37,353	38,338	38,656	39,099	39,655	40,507	40,649	40,862	41,280	41,515	42,028	42,287	42,839									
T.S.E. Industrial Index ^u		1956 = 100	166.2	181.6	197.3	203.6	197.7	200.0	204.0	199.7	204.8	214.1	210.8	203.2	215.4	221.6									
Business Failures ^u		Number	94	61	44	61	135	78	153	94	84	101	67	100	102	82									
Business Failures — Liabilities ^u		\$ Million	5.7	3.7	3.4	4.7	8.7	9.0	7.7	4.3	3.9	7.4	4.5	4.1	13.8	3.8									
Coincidental and Lagging Indicators																									
Gross National Product ^c (Annual Rate)		\$ Million		96,596		98,992			101,964			103,728				107,056									
Average Hourly Earnings in Manufacturing																									
3-Month Treasury Bill Rate ^{c,u}		Dollars Per Cent	3.52	3.53	3.62	3.66	3.66	3.70	3.69	3.68	3.73	3.79	3.82	3.84	3.86	3.87									
Cheques Cashed in Clearing Centres ¹		\$ Million	3.24	3.21	3.36	3.45	3.57	3.64	3.73	3.50	3.46	3.50	3.62	3.57	3.68	3.65									
Retail Trade		\$ Million	8,248	8,098	7,627	7,940	7,508	8,010	7,409	8,144	8,437	8,751	8,470	8,936	8,449	8,768									
Labour Force		000's	1,036	1,013	1,038	1,040	1,042	1,072	1,083	1,081	1,093	1,088	1,098	1,128	1,115	1,107									
Employed		000's	3,314	3,318	3,349	3,338	3,366	3,352	3,371	3,370	3,377	3,395	3,408	3,408	3,416	3,441									
Unemployed		000's	3,135	3,153	3,188	3,185	3,208	3,209	3,220	3,207	3,219	3,224	3,227	3,227	3,243	3,269									
Unemployed as % of Labour Force		Per Cent	179	165	161	153	158	143	151	163	158	171	181	181	173	172									
Wages and Salaries		\$ Million	5.4	5.0	4.8	4.6	4.7	4.3	4.5	4.8	4.7	5.0	5.3	5.3	5.1	5.0									
Index of Industrial Employment		1961 = 100	1,809	1,827	1,853	1,857	1,875	1,894	1,893	1,922	1,923	1,933	1,952	1,973	1,997	2,027									
			131.9	131.5	132.2	132.3	133.2	133.9	134.8	134.8	134.4	133.5	134.2	136.2	135.7	134.6									
Index of Industrial Production ^c																									
Total Manufacturing ^c		1961 = 100	187.5	187.8	189.4	189.5	191.1	195.1	192.8	194.0	194.0	192.6	195.4	200.4	202.3	203.3									
Non-Durables ^c			184.0	184.3	186.1	185.0	187.1	191.0	188.3	190.9	191.6	189.8	191.9	194.3	196.0	198.5									
Durables ^c			163.4	163.7	164.5	162.9	165.4	169.4	167.5	172.0	170.4	169.1	171.4	172.7	173.1	175.9									
Mining ^c			210.1	210.3	213.3	213.1	214.6	218.4	214.6	214.8	218.5	216.1	217.9	221.5	225.0	227.1									
Electric Power and Gas Utilities ^c			190.2	190.6	192.2	194.9	193.3	200.8	197.2	189.3	185.3	185.0	192.8	210.9	212.7	206.7									
Primary Energy Demand (Annual Rate)		BKWH	213.3	213.8	213.5	218.8	221.9	221.3	224.3	228.2	228.3	227.9	229.2	236.4	239.6	239.2									
Exports (including re-exports) ^c		\$ Million	70.26	68.83	70.19	72.37	72.63	72.07	71.74	72.90	73.58	73.16	74.64	76.15	76.56	75.43									
Imports ^c		\$ Million	1,507	1,508	1,485	1,580	1,551	1,559	1,675	1,750	1,486	1,600	1,569	1,859	1,982	1,826									
			1,387	1,362	1,496	1,416	1,517	1,525	1,538	1,514	1,532	1,603	1,531	1,667	1,671	1,707									
Unclassified Indicators																									
Foreign Exchange Reserves ^{c,u}		U.S. \$ Million	4,573	4,852	4,838	4,841	4,903	5,005	5,210	5,376	5,349	5,358	5,370	5,372	5,191	5,189									
Industrial Materials Price Index ^{c,u}		1935-39 = 100	267.9	269.8	277.1	282.8	291.7	290.6	294.5	295.7	294.9	300.9	303.1	317.4	319.4	325.4									
Consumer Price Index ^{c,u}		1961 = 100	135.4	136.3	136.7	137.3	137.4	138.2	138.3	138.5	140.2	141.3	141.8	142.0	142.3	143.3									
Toronto ^u			130.5	131.6	132.0	132.8	132.6	133.4	133.4	133.9	135.7	135.9	136.6	136.2	136.6	137.7									
Ottawa ^u			132.3	133.0	133.6	133.9	134.1	135.1	134.7	134.9	136.1	137.4	137.9	137.6	138.2	139.1									
Thunder Bay ^u		1969 = 100	104.9	105.4	105.8	106.3	106.3	107.0	107.1	106.6	107.2	108.4	108.9	108.5	109.1	109.5									
Purchasing Power of 1961 Consumer Dollar ^{c,u}			0.74	0.73	0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70	0.70	0.70									

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.



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